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OBSERVATIONS ON THE USE OF DDT FOR THE CONTROL OF *ANOPHELES QUADRIMACULATUS*

By R. L. Metcalf,[1] A. D. Hess,[1] G. E. Smith,[2] G. M. Jeffery,[2] and G. W. Ludwig [2]

INTRODUCTION

In the early spring of 1943 the Orlando laboratory of the United States Bureau of Entomology and Plant Quarantine brought to the attention of the Health and Safety Department of the Tennessee Valley Authority a promising new anopheline larvicide. This material was "DDT" [2,2-bis(parachlorophenyl)-1,1,1-trichloroethane], then referred to by the trade name of "Gesarol." Because of the Authority's long experience with airplane dusting, in connection with its routine malaria control program, it was suggested that the research staff of the Health and Safety Department undertake field tests to determine the practicability of airplane application of DDT larvicidal dusts for the control of *Anopheles quadrimaculatus*. Accordingly, a series of airplane dusting field tests was run with this material during the summer of 1943. During the following winter several joint conferences were held by the technical staffs of the Orlando laboratory and the Authority to plan further cooperative studies. As a result, the Authority greatly intensified its DDT research program during the summer of 1944 and expanded it to include laboratory and field studies on house spraying and investigations on the effectiveness of DDT as an anopheline larvicide and adulticide when distributed by airplane as a dust, a spray, or a thermal aerosol. During the course of the studies, advice and field assistance were provided from the Orlando laboratory, the Office of the Surgeon General of the United States Army, research groups of the National Defense Research Committee from the University of Illinois and Columbia University, and the Office of Malaria Control in War Areas, of the United States

[1] Biology Section, Health and Safety Department, Tennessee Valley Authority, Wilson Dam, Ala.
[2] U. S. Public Health Service, detailed to Health and Safety Department, Tennessee Valley Authority, Wilson Dam, Ala.

Public Health Service, the latter assigning three of its staff members to the studies at different periods of the season.

The purpose of this paper is to present the results of the studies on DDT carried out in the Tennessee Valley during 1943 and 1944.

USE OF DDT AS A HOUSE SPRAY

STUDIES ON ACUTE TOXICITY

During the winter of 1943 a series of laboratory tests was run to determine the acute toxicities of DDT and pyrethrins for insectary-reared *A. quadrimaculatus* adults. The tests were carried out in a modified Peet-Grady chamber, the inside dimensions of which were 4′ x 4′ x 4′. The inside of the chamber was covered with a heavy kraft paper and was repapered before each test in order to avoid the effects of residual toxicity. The materials were applied as aqueous emulsions with a small specially designed spray gun operated from a hand-pumped pressure tank.

On the basis of a half dozen tests run at varying dosages with each material, the following estimates have been made of the median lethal doses of DDT and pyrethrins:

Material:	LD_{50} in milligrams per 1,000 cubic feet	
	Males	*Females*
DDT	7.0	12.0
Pyrethrins	1.0	1.5

It will be observed that male *A. quadrimaculatus* were more susceptible to both materials than were females. Pyrethrins appeared to be seven to eight times as toxic as DDT.

STUDIES ON RESIDUAL TOXICITY

Board tests.—In view of the promising results which had been obtained at the Orlando laboratory, a series of tests was run to determine the residual toxicity of DDT to adult *A. quadrimaculatus*. Six-inch squares of "Beaver Wall Board" were treated with varying dosages of a water emulsion of DDT made from a stock solution containing 20 percent DDT, 20 percent Triton (emulsifier), and 60 percent xylene. At varying intervals after treatment, 1-day-old insectary-reared *A. quadrimaculatus* adults were confined on the boards in half petri dishes for 5-, 30-, and 60-minute periods, following which they were observed for mortality over a 24-hour period. Ten to twenty mosquitoes were used in each test and parallel controls were run on each lot. The boards were stored in a cabinet between tests. The results obtained from the studies are presented in table 1. It will be observed that there were no significant differences in the initial toxicities at the varying dosages, the percent mortality being determined primarily by the period of contact. This suggests that, within the limits of the dosages used, the lethal action of DDT was

TABLE 1.—*Effect of aging on toxicity of DDT-treated surfaces to* Anopheles quadrimaculatus

Age of treatment	Percent mortality in 24 hours							
	5-minute contact		30-minute contact		60-minute contact		Controls	
	Male	Female	Male	Female	Male	Female	Male	Female
40 MG. DDT PER SQUARE FOOT								
New	50	18	100	82	100	100	0	0
1 week	8	7	90	75	100	100	0	0
2 weeks	12	0	83	100	100	100	7	0
4 weeks	11	0	85	38	100	100	0	0
8 weeks	0	0	33	0	75	20	0	0
12 weeks	0	16	50	20	100	44	13	5
16 weeks	0	0	0	0	0	0	0	7
200 MG. DDT PER SQUARE FOOT								
New	80	20	100	100	100	100	0	[illegible]
1 week	78	43	100	100	100	100	0	[illegible]
2 weeks	20	0	100	100	100	100	20	[illegible]
4 weeks	90	55	100	91	100	100	0	[illegible]
8 weeks	66	14	100	25	100	71	30	[illegible]
13 weeks	45	10	72	44	85	62	14	[illegible]
16 weeks	0	0	14	0	52	22	0	[illegible]
1,000 MG. DDT PER SQUARE FOOT								
New	82	14	100	89	100	100	22	0
1 week	75	68	100	100	100	100	0	[illegible]
2 weeks	50	66	100	100	100	100	0	[illegible]
4 weeks	66	80	100	100	100	100	0	[illegible]
8 weeks	20	0	100	100	100	100	11	[illegible]
12 weeks	16	6	78	83	100	100	14	[illegible]
16 weeks	8	0	35	0	100	30	0	[illegible]

limited by some physiological reaction, such as the rate of absorption through the feet of the insects. Even at dosages as high as 1,000 mg. per square foot, 100 percent mortality did not result from 5-minute exposures; however, 60-minute exposures to this dosage gave 100 percent mortality as long as 12 weeks after treatment.

Results from a parallel series of tests run with smooth wooden boards were not significantly different from those obtained with the wallboard. Enameled surfaces, however, showed a high initial toxicity but lost this toxicity almost entirely within 2 weeks.

Keg tests.—Further information on the residual toxicity of DDT to adult *A. quadrimaculatus* was obtained through observations with small wooden nail kegs. On April 29, 1944, these kegs were treated at the following dosages with aqueous emulsions of DDT made from the same xylene concentrate used in the board tests: 20, 200, and 2,000 mg. per square foot. The three treated kegs and an untreated control were placed side by side in some heavy woods where high densities of *A. quadrimaculatus* prevailed. At intervals thereafter knockdown times were determined for wild *A. quadrimaculatus* adults obtained from untreated kegs placed in favorable diurnal resting places (*4*) in the same area. The results are summarized in figure 1.

TABLE 3.—*Effect of DDT-treated house on introduced* Anopheles quadrimaculatus *adults*

Date	Days after spraying	Time of day	Temperature (degrees F.)	Total number adults	Adults leaving house		Mortality of those leaving (knockdown)		Time for complete knockdown in house
					Percent	Time after entrance	Percent	Hours after leaving	
1944									*Minutes*
July 4	2	8:45 p. m.	80	629	88	15 minutes	100	3¼	120
July 6	4	1:30 p. m.	85	910	84	30 minutes	96	4	75
July 8	6	6:50 a. m.	71	1,584	60	65 minutes	85 99	4 24	70
July 12	10	12:15 p. m.	90	494	70	50 minutes	95	2	50
July 18	16	7 a. m.	96	3,000	64	30 minutes	100	24	90
July 20	18	12 m.	100	2,000			50 100	1 24	45
Aug. 3	31	11 a. m.	94	416	48	1¼ hours	100	24	80
Aug. 19	47	1:10 p. m.	93	540	50	3 hours	100	5	180
Aug. 30	58	12 m.	93	237	61	1¼ hours	100	5½	150
Sept. 6	65	1:35 p. m.	90	158	40	2 hours	90 100	3½ 19½	120
Sept. 27	86	11:15 a. m.	87	460	57	2 hours	98	5	120
Oct. 16	105	12:30 p. m.	79	176	28	2 hours	46 96	3 6	145

Two of these blocks were in the Blackwell Swamp area of Wheeler Reservoir and the other was in the Springville area of Kentucky Reservoir. The first block of houses in the Blackwell Swamp area (treated on July 4) was studied much more thoroughly than the others and will form the basis of this discussion. The statistics of DDT spraying in this area are given as follows:

Size of area .... square miles (approximately)	2
Number of houses treated	21
Number of rooms treated	66
Average amount DDT stock per house .... quarts	1. 4
Approximate rate of DDT application .... milligrams	200 per square foot
Average time required per house:	*Minutes*
Spraying	14. 5
Other	12. 0
Total	26. 5

The stock solution consisted of 25 percent DDT, 7 percent Triton, and 68 percent xylene. For application, the stock solution was mixed 1 to 4 with water, giving a 5 percent DDT concentration in the finished spray. The spraying was done by a 2-man crew using a portable, hand-spray rig (fig. 3) which gave a wet spray suitable for impingement on walls and ceilings. This spraying equipment has been described in detail by Kiker and Sparkman (*1*). It is estimated that in a typical rural section of the Tennessee Valley 2 men with this equipment and a pick-up truck should be able to treat about 20 houses per day, with their total daily travel between houses averaging about 50 miles.

FIGURE 2.—Experimental houses in the Blackwell Swamp area of Wheeler Reservoir used for observing the effectiveness of DDT residual sprays. The house in the background was sprayed with DDT at the rate of 250 mg. per square foot, and the one in the foreground was left untreated to serve as a control. Screen entrance and exit cones and an exit trap are in place on the house in the foreground.

A. Application of DDT residual spray to the inside of a house Pictures, clothing, etc., were not removed from the wall. A respirator was worn while applying the spray.

B. Application of DDT residual spray to the porch of a rural house.

FIGURE 3.—Application of DDT residual sprays.

No attempt was made to clear the walls and ceilings of pictures, garments, etc., as it was reasoned that mosquitoes would rest on these after the walls were sprayed. Furniture was pulled out from the walls in order to spray thoroughly the corners of the rooms. Food left in the open was covered with paper or cloth before spraying.

As the concentration of xylene in the emulsion mixture was some 12 times the maximum permissible concentration set by the American Standards Association for prolonged exposure, and as the toxicity of DDT under these conditions is unknown, the workers were equipped with respirators offering protection against organic vapors. It was determined, however, that the maximum concentration of xylene was considerably below the lower explosive limit; therefore, cooking fires were not extinguished before spraying.

Evaluation of the results of this treatment was difficult. Three methods could be used: (1) the numbers of *A. quadrimaculatus* found in the treated houses; (2) the release of adult mosquitoes in treated houses; and (3) information that could be derived from questioning the inhabitants of the residences. The first method could not be used to advantage since even before treatment the number of mosquitoes found in most of the houses during the day was extremely small even though night biting was severe. No adult *A. quadrimaculatus* were ever found resting in any of the houses following treatment although they were examined frequently during the remainder of the summer and early fall.

Release of mosquitoes in the occupied dwellings treated with DDT on July 4 showed that these houses remained toxic to *A. quadrimaculatus* adults for the remainder of the season. However, comparative studies indicated that the occupied houses lost their toxicity more rapidly than the uninhabited experimental houses. For example, the time required for complete knockdown of *A. quadrimaculatus* adults in the papered living room of an inhabited house 8 weeks after treatment was 230 minutes; a parallel test run in the unoccupied papered house gave a total knockdown time of only 150 minutes. The maximum time required for complete knockdown in the unoccupied house during the 15-week period after treatment was 180 minutes.

It was difficult to make an evaluation of the routine house spraying by means of the third method (questioning of inhabitants). The reaction of the people varied considerably, but it was quite evident that the mosquito situation had been improved for considerable periods of time in all the houses. About a week after treatment the houses were inspected and the residents interviewed. In almost all cases it was found that the mosquitoes were not staying in the houses or biting to any great extent. A typical comment was that the mosquitoes would enter the house in the evening, buzz around a while, and then leave without biting. An even more spectacular

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result of the treatment was the almost complete absence of houseflies. In houses which had been heavily infested before treatment there were practically no living flies to be found.

Two weeks after spraying, the situation was somewhat the same. The flies were still controlled completely, and there were only a few complaints that the mosquitoes were beginning to bother again.

Four weeks after treatment, the situation had changed noticeably. The sentiments of the inhabitants were about equally divided between those who thought that the mosquitoes were still under control and those who were convinced that the treatment was no longer effective. In all cases more mosquitoes were apparently entering the houses and staying for longer periods, and in many of the houses it was claimed that they were again biting as much as before treatment. However, it was stated by some that the mosquitoes were still not biting. It was interesting to note that without exception the flies were still being controlled in all sprayed houses.

Two weeks later (6 weeks after treatment) the houses were again inspected, but the situation was about the same as found in the previous inspection. A typical response of the inhabitants was that the mosquitoes were coming into the house in large numbers in the evening and were extremely bothersome for 30 to 40 minutes. They then quieted down and were not active for the rest of the night. In all cases the flies were still under control.

Another inspection on September 16, 1944, about 10 weeks after treatment, indicated that the mosquitoes were again about as bad as they were before treatment although the biting rates were still not as high and the biting did not continue as long through the night. The houseflies were still under control. One of the houses had been rebuilt and the walls repapered, and in this house numerous flies could be found while they were still absent from houses which had been treated. A general conclusion can be reached that the treatment with DDT remained fairly effective for at least 1 month and was effective to a lesser degree for another month at least.

Flaking tests.—It was noticed in the course of the summer's work that mosquitoes in cages not actually in contact with DDT-treated surfaces repeatedly suffered 100 percent mortality in 24 to 48 hours. This was not due to fumigational effect because mosquitoes placed in a container with a large amount of crystalline DDT, but prevented from coming into contact with it by screen, were not affected. Several experiments were conducted to determine if the mortality was caused by the flaking off of minute DDT crystals. On several occasions, 2 wire cages containing *A. quadrimaculatus* adults were suspended, 1 each in the DDT-treated house and the untreated control house. In one case 50 percent of the mosquitoes in the cages in the treated house were down after 12 hours, while none were down in the control. In

another case 98 percent were down after 12 hours in the treated house, while only 2 percent were down in the control. In another experiment, 10 mosquitoes were placed in each of 4 ice cream cartons with cheesecloth tops. One carton was placed in the center of a DDT-treated room, another in a corner, the third in the center but protected from falling DDT crystals by a piece of cardboard supported 2 inches above the top, and the fourth was placed in an untreated room to serve as a control. The results were as follows:

	Percent knockdown			
Time:	*Center covered*	*Center open*	*Corner open*	*Control*
24 hours	0	10	30	0
48 hours	20	100	100	0

Similar results were obtained by suspending caged mosquitoes in DDT-treated kegs. It therefore appears that the loss in toxicity of DDT-treated surfaces through aging is due principally to the flaking off of the DDT crystals rather than to volatilization. Accelerated flaking due to vibration may also be a reason for inhabited houses losing their toxicity more rapidly than uninhabited houses.

Relation of type of surface to residual toxicity.—As pointed out in the discussion of the board tests, smooth enameled surfaces treated with DDT lost their residual toxicity for *A. quadrimaculatus* adults much more rapidly than did rough wallboard. This suggested that the type of wall surface might be important in relation to the residual toxicity of DDT-treated houses. Accordingly, parallel observations were made in a house with papered rooms and one with rough wooden surfaces. As was observed in the board tests, the smooth papered surfaces lost their toxicity more rapidly than the rough wooden surfaces. For example, 8 weeks after treatment the time required for complete knockdown of *A. quadrimaculatus* adults in the papered house was 150 minutes, while in the wooden-surfaced house it was only 90 minutes. The difference was probably due to the more rapid flaking off of the DDT from the papered surfaces.

Similar results were obtained by suspending cages of adult *A. quadrimaculatus* in DDT-treated kegs with natural wooden surfaces and in kegs lined with smooth kraft paper. The rate of knockdown was usually greater in the papered kegs than in the unpapered kegs, indicating a more rapid flaking off of DDT from the papered surface than from the wooden surface.

REPELLENCY OF DDT-TREATED SURFACES

Preliminary observations indicated that DDT-treated surfaces might have a repellent as well as a toxic effect upon *A. quadrimaculatus* adults. Repellency studies were therefore carried out in DDT-treated kegs, barns, and houses.

Keg tests.—Information on the repellent effect of DDT was

obtained by comparative observations with treated and untreated nail kegs. During the early part of May a series of kegs was placed around the Blackwell Swamp area of Wheeler Reservoir in situations where they would serve as favorable diurnal resting places for adult *A. quadrimaculatus.* Large numbers of mosquitoes began using the kegs, and at 3 o'clock one afternoon over 2,000 *A. quadrimaculatus* adults were observed in one keg. This keg was removed and replaced by 3 kegs which had been treated on April 29 with an aqueous emulsion of DDT at the rate of about 200 mg. DDT per square foot. At 3 p. m. on the following day, the treated kegs were inspected and no mosquitoes were found in any of them, although untreated kegs in the same area contained large numbers of *A. quadrimaculatus* adults. Since no dead mosquitoes were found in the kegs, it was apparent that they had been repelled by the DDT. The next step was to determine whether the mosquitoes were repelled before they alighted upon the DDT-treated surface or if they were caused to leave by the irritation resulting from a period of resting upon it. Accordingly, a treated and an untreated keg were placed side by side and observed in the early morning hours. At 5 a. m. there were no mosquitoes in either keg, but at 5:15 a. m. (just at the break of dawn) mosquitoes started entering the kegs. They appeared to enter the treated as freely as the untreated keg, several hundred entering each keg in a 10-minute period. However, the mosquitoes which entered the treated keg began to show signs of agitation within about 5 minutes, and within 20 minutes all had left, most of them apparently flying into the untreated keg. It therefore appears that DDT acts as an irritant to *A. quadrimaculatus* adults and that the mosquitoes must actually rest upon the DDT-treated surface for a short period in order to be repelled by it.

In order to determine if the mosquitoes had received a lethal dose of DDT before leaving the treated keg, the experiment was repeated and after a large number of *A. quadrimaculatus* adults had entered the keg, a screen trap was placed over the opening to catch them as they emerged. The trapped mosquitoes were then observed for mortality, and within 48 hours all had died. This would indicate that *A. quadrimaculatus* adults which rest upon DDT-treated surfaces receive a lethal dose before they are sufficiently irritated to leave.

Barn tests.—The effectiveness of DDT residual sprays in keeping barns free of mosquitoes has been previously discussed (table 2). The almost complete absence of mosquitoes in the treated sides of the barns, while the populations of adults in the untreated sides and in the control barn remained high, is a definite indication of the repellent effect of DDT against *A. quadrimaculatus* adults. The mosquitoes apparently entered the treated and untreated sides of the barns in equal numbers in the early hours of the morning when seeking out a diurnal resting place, but left the treated side shortly there-

after. An inspection of the treated stalls in one barn before daylight revealed about 10 mosquitoes in the treated stalls and a few more in the untreated, but several hours later there were none to be found in the treated side, while a large number were resting in the untreated stalls. These data give additional support to the conclusion reached from the keg studies that *A. quadrimaculatus* will not rest on DDT-treated surfaces for any length of time if the structure is open and the insects are able to leave.

It was interesting to note that in addition to the absence of mosquitoes resting in the treated stalls there was also an almost complete absence of flies and other insects, although they abounded in the untreated stalls and barn.

Experimental house tests.—Observations on the repellent effect of DDT in the experimental houses during the first few days after treatment (250 mg. DDT per square foot) indicated that the DDT spray was rather effective in preventing the biting of *A. quadrimaculatus*. For example, on July 7 (5 days after treatment) one person spent the night in one of the DDT-treated houses with the door left open, while another remained in the control house nearby. Although many mosquitoes entered both buildings, only 4 bites were received by the person in the DDT-treated house, while a large number of bites were received by the person in the control house. Similar observations carried out on July 13 (11 days after treatment) indicated that the biting rate in the treated house had increased, as many as 5 bites being recorded in one 15-minute period. However, the treatment was still fairly effective in reducing the biting rate. An estimated 500 mosquitoes entered the building during a 15-minute period at the break of dawn (5 a. m. to 5:15 a. m.), but only a few of them took blood meals. By 6:45 a. m., all of the mosquitoes had escaped from the building except one engorged female which was dead upon the floor; in the untreated control house, large numbers of adults were resting in the normal manner.

On the night of July 25 (23 days after treatment), observations were made in the treated house with the door closed, the entrance cones open, and the exit traps in place. During the night, 72 adult *A. quadrimaculatus* entered the house and 17, or approximately 25 percent, of these took blood meals from the person occupying the house. On the following morning 9 of the 17 engorged females had escaped into the exit trap, and 3 of them were already dead; 8 of the females which took blood meals died before they escaped from the building. During the same night only 40 *A. quadrimaculatus* adults entered the control house in which an individual spent the night protected from bites by mosquito netting. These observations are in agreement with the results of the keg and barn tests and indicate that DDT residual sprays are not effective in preventing mosquitoes

from entering a building, but exert their repellent effect as irritants after the mosquitoes have been in contact with the DDT-treated surface for a short period.

The data which have been presented in table 3 give further information on the repellent effect of DDT residual sprays. It will be observed that the percent of mosquitoes escaping from the experimental house was highest (84 and 88 percent) during the first few days after treatment. This would indicate that DDT produces an irritant effect much more rapidly on freshly treated surfaces and thus causes a higher percentage of the mosquitoes to leave before being knocked down. This offers a logical explanation for the observed effectiveness of DDT residual sprays in preventing biting during the first week or two following application.

Although a major portion of the mosquitoes released in the experimental house during the first few days after treatment escaped to the outside, they had already received a lethal dose of DDT in their brief period of contact with the treated surfaces as is evidenced by the mortality records given in table 3. All of the mosquitoes which escaped into the window traps on the second day after treatment were dead within 3¼ hours. This high mortality of mosquitoes escaping from the treated building continued during the entire 105-day posttreatment period. Under comparable conditions, it is evident that at least 95 percent, and probably almost 100 percent, of the *A. quadrimaculatus* adults entering a DDT-treated building would receive a lethal dose before they could escape, although the percent mortality might be somewhat lower in more open structures. It therefore appears that most of the mosquitoes which might enter a DDT-treated building and feed upon a person with malaria would be killed before they could transmit malaria to another person, even though a considerable portion might escape from the building before dying. Thus, the use of DDT residual sprays should be an effective means of breaking the chain of malaria transmission between gametocyte and sporozoite formation.

Routine house-spraying tests.—As has been previously pointed out, it was difficult to evaluate the effectiveness of the routine house-spraying tests. However, some evidence of the repellent effect of the DDT sprays may be obtained from the comments of the occupants, which were summarized in the discussions on residual toxicity. From these comments it appears that the DDT sprays largely prevented mosquito biting for the first week or two after their application. Following this there was a gradual increase in the biting rate although there was some evidence of partial protection from biting for as long as 8 or 10 weeks after treatment. These general observations on the repellency of DDT residual sprays are in agreement with the results of the more detailed studies carried out in the experimental houses.

REACTION PATTERN OF MOSQUITOES TO DDT-TREATED SURFACES

During the course of the experimental house studies, some 10,000 *A. quadrimaculatus* adults were released in one of the sprayed houses, and their reactions to the DDT-treated surfaces were observed (table 3). Exit traps were kept on the windows to catch the mosquitoes which left the house. The pattern of reaction remained rather constant during the entire 15-week period of posttreatment observation and may be summarized as follows:

1. Within 5 minutes after release during the daytime, approximately 95 percent of the mosquitoes released are at rest on walls and ceiling in the darkest corners.
2. Fifteen to twenty minutes after release, this condition is completely reversed; 95 percent of the mosquitoes are to be found flying about the room seeking exit.
3. From 20 minutes to 1 hour after release, the mosquitoes remaining in the house become progressively more uncoordinated and fly aimlessly into the walls and floor, sounding like raindrops hitting a roof.
4. Within 45 to 180 minutes after release, all of the mosquitoes either leave the house or are knocked down on the floor.
5. Of the mosquitoes escaping the house, 95 to 100 percent die within 24 hours, the majority dying within 2 to 3 hours.

Mosquitoes released in the same manner in the control house quickly settled in the darkest corners and remained there throughout the day. It is thus evident that the irritant effect of DDT produces a complete reversal of the normal light reactions of *A. quadrimaculatus* adults.

USE OF DDT AS A LARVICIDE

BOAT DISTRIBUTION OF DDT

Boats have been used rather extensively by the Authority for applying anopheline larvicides in situations where it was not feasible to use airplanes. The standard larvicide has been a 9 to 1 mixture of kerosene and black oil, usually applied at rates of 25 to 40 gallons per acre. The solubility of DDT in kerosene and its high toxicity to anopheline larvae suggested its use in boat oiling operations as a means of reducing the amount of larvicide required. Accordingly, some tests were run with a 2.5-percent solution of DDT in kerosene, applied as a mechanical water emulsion with a modified boat oiling unit (*1*). The tests were run in the fall of 1944 in the Kentucky Reservoir, which was then undergoing its initial impoundage. Unusually high densities of *A. quadrimaculatus* prevailed in the experimental area, larval counts averaging from about 2 to 8 per square foot. In the first test the material was applied at a rate of approximately 0.6 gallon of the 2.5-percent solution per acre, which was equivalent to about 0.1 pound DDT per acre. This treatment gave a very satisfactory control, with the larval kill averaging 96 percent. In a second test, treatment was made at the rate of about 0.05 pound DDT per acre (0.3 gallon of 2.5-percent solution). At this rate, the control

was somewhat spotty, the larval kill ranging from 77 to 96 percent in different parts of the treatment area. It therefore appears that a dosage of about 0.1 pound DDT per acre is required for effective control of *A. quadrimaculatus* larvae when applied by this method. This rate of application would result in a decrease of about 98 percent in the amount of kerosene used and would thereby effect a considerable reduction in the cost of boat oiling operations.

AIRPLANE DISTRIBUTION OF DDT

Dusts.—During the summers of 1943 and 1944, a series of field tests was run to determine the feasibility of applying DDT dust larvicides by means of the Stearman airplanes, used by the Authority to distribute paris green for the control of *A. quadrimaculatus* (*2*). In the initial tests it was found that DDT powder, diluted with soapstone at the customary ratio of 1 to 4, produced a very sticky mixture which clogged in the plane hopper and fell in large chunks. With this material, rates of application as high as 2 pounds per acre were required for satisfactory control. Under reservoir conditions no residual toxicity to *A. quadrimaculatus* larvae was observed with this high rate of application. When the concentration of DDT was reduced to 10 percent, more satisfactory results were obtained, but even then the dust tended to pack in the hopper and did not discharge freely. It was found necessary to reduce the concentration of DDT to 5 percent before a satisfactory dusting mixture could be obtained. With this low concentration dust, 90 percent larval control was obtained over 200-foot swaths at actual application rates as low as 0.05 pound DDT per acre. The results of five airplane dusting tests are given in table 4.

TABLE 4.—*Effectiveness of DDT dusts applied by Stearman airplane for the control of* Anopheles quadrimaculatus *larvae, 1943—44*

DDT concentration (percent)	Discharge DDT (pounds per acre per 100-foot swath)	Plant cover	Number of larvae per square foot (before treatment)	Percent control	Swath width (feet)
25	1.9	Medium *Nelumbo* *Panicum* *Persicaria*	1.6	99 63	100 200
10	.9	Medium *Panicum* *Eleocharis* *Ammannia*	[1] 12.0	95 70	120 200
10	.9	Heavy *Saururus* *Panicum* *Peltandra* *Persicaria*	[1] 12.0	93 78	120 200
5	.1	Low *Persicaria*	6.2	100 85	150 250
5	.1	Medium *Persicaria* *Saururus*	2.0	98	180

[1] Larvae planted in floating wooden frames.

Although the 5-percent DDT dust gave very satisfactory results, its use was objectionable because the high percentage of inert diluent greatly decreased the pay load of the dusting plane. Attention was therefore shifted to the airplane distribution of liquid solutions of DDT.

Sprays.—Following the lead of the Orlando laboratories of the United States Bureau of Entomology and Plant Quarantine, the first DDT larvicidal sprays were applied as oil solutions distributed by a Cub airplane (Model J3 with 65-hp. Continental engine). The airplane was equipped with a spray unit developed by the Orlando group and loaned to the Authority for use in field experiments. Very satisfactory anopheline control was obtained with this unit when DDT was applied as a 5-percent solution in kerosene or as aqueous emulsions at rates of 0.1 to 0.25 pound per acre (table 5); however, the effective swath width was never in excess of 40 feet and the pay load was severely limited. In an attempt to improve these features, attention was turned toward the adaptation of the Authority's Stearman dusters for the distribution of larvicidal sprays. One of the reserve gasoline tanks located in the top wings was used to hold the DDT solutions. A small wind-driven oil pump attached to the landing gear superstructure supplied the necessary pressure, and the spray was discharged through seven whirl-disc nozzles located on the trailing edges of the lower wings (fig. 4A). This unit proved to be more satisfactory than the Cub unit, having a much higher pay load and a greatly increased swath width. It soon became apparent, however, that for airplane

TABLE 5.—*Effectiveness of DDT sprays applied by Cub and Stearman airplanes for the control of* Anopheles quadrimaculatus *larvae, 1944*

Material	Plane	Equipment	Discharge DDT (pounds per acre)	Swath width (feet)	Plant cover	Number of larvae per square foot (before treatment)	Percent control	Swath width
5 percent DDT in kerosene.	Cub	6 whirl disk nozzles (0.067" orifice) in venturi throat.	0.26	40	Low *Aster* *Persicaria* *Panicum*	3.3	97	Routine. 40 feet.
5 percent DDT in kerosene.	do	do	.12	40	Medium *Echinodorus*	1.4	100	Routine. 40 feet.
5 percent DDT aqueous emulsion.[1]	do	do	.10	40	Low *Tecoma* *Juncus* *Panicum*	.56	100	Routine. 40 feet.
20 percent DDT in Velsicol NR-70.	Stearman	7 whirl disk nozzles (0.0465" orifice) along lower wings.	.08	100	Medium-high *Saururus* *Nelumbo*	1.9	100 87	120 feet. 350 feet.
15 percent DDT emulsion.[2]	do	do	.06	100	Heavy *Saururus*	2.0	100	200 feet.

[1] Made from stock solution consisting of 25 percent DDT, 68 percent xylene, and 7 percent Triton (emulsifier).
[2] Made from stock solution of 30 percent DDT in Velsicol NR-70 mixed in equal parts with water and emulsified with Vatsol.

distribution a solvent was needed which would dissolve a large amount of DDT yet would have a high boiling point and be of low viscosity. Certain polymethylnaphthalenes [3] were found to meet these requirements. Fifteen- to forty-percent solutions of DDT in this material gave adequate larval control over 200- to 300-foot swaths when applied with the Stearman unit. Larval kills of 90 percent or better were obtained at actual treatment rates of less than 0.03 pound of DDT per acre. The spray consisted of droplets from 100 to 500 microns in diameter which at the rates of application used did not form a complete surface film. Effective results were also obtained when these solutions were applied in the form of water emulsions.

One objection to the airplane sprays was the fact that they were almost invisible. The high visibility of the regular paris green-soapstone dust cloud aids the pilot in gauging swath widths and determining the distribution of the larvicide.

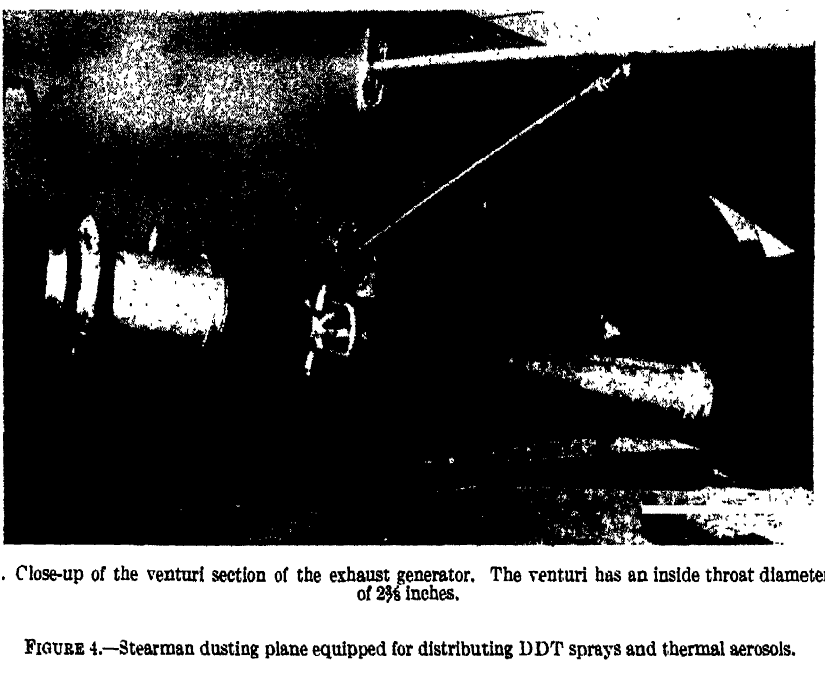
Table 5 presents the data obtained from a series of field tests on the airplane distribution of larvicidal sprays.

Thermal aerosols.—In an effort to obtain a finer breakup of the DDT solutions than could be obtained with airplane spraying equipment, attention was turned toward the use of exhaust generators to produce thermal aerosols. The Orlando laboratories had reported successful results with an exhaust generator fitted to a Cub airplane, and it was decided to equip in a similar manner one of the Authority's Stearman dusting ships. The first unit consisted of a pipe 4 inches in diameter extending 22 feet from the exhaust manifold to the rear of the plane. Solutions of DDT in Velsicol were injected into the pipe through various types of nozzles. The temperature of the exhaust gases in the pipe was about 1,100° F. with a mean velocity of about 235 feet per second. Using a 20-percent solution of DDT in Velsicol NR-70 discharged downstream through a ⅛-inch jet at the center of the pipe, the generator produced a fine aerosol spray in which most of the particles were between 15 and 60 microns in diameter. However, a sufficient amount of smoke (less than 1 micron in diameter) was produced to make the aerosol cloud quite visible (fig. 5).

DDT thermal arerosols distributed with the 4-inch exhaust generator gave very satisfactory control of anopheline larvae, 90-percent kill being obtained at actual treatment rates as low as 0.03 pound DDT per acre (table 6), but it produced an objectionable back pressure on the airplane engine. The 4-inch pipe was therefore replaced by a 6-inch pipe. The temperature of the exhaust gases in this generator was about 1,000° F. with a mean velocity of about 105 feet per second. With the 20-percent solution of DDT in Velsicol, the 6-inch generator produced either a pure smoke or smoke and coarse spray, depending on the position of the nozzle in the pipe. DDT thermal aerosols

[3] Manufactured by the Velsicol Corporation, Chicago, Ill.

A. View of airplane showing the 6″ exhaust generator equipped with venturi for distributing thermal aerosols. Note also the nozzles along the trailing edge of the lower wing for distributing oil sprays.



B. Close-up of the venturi section of the exhaust generator. The venturi has an inside throat diameter of 2⅜ inches.

FIGURE 4.—Stearman dusting plane equipped for distributing DDT sprays and thermal aerosols.

A. View of aerosol cloud immediately after being discharged from the airplane.

B. View of the aerosol cloud a few seconds later, showing how it settles to the water surface. Note also the swirling action of the finer parts of the cloud as it reaches the water surface.

FIGURE 5.—Stearman airplane equipped with venturi exhaust generator distributing DDT thermal aerosol.

TABLE 6.—*Effectiveness of DDT thermal aerosols distributed by airplane for the control of* Anopheles quadrimaculatus *larvae, 1944*

Material	Plane equipment	Discharge DDT (lbs. per acre per 100-foot swath)	Plant cover	Number of larvae per square foot (before treatment)	Percent control	Swath width
20 percent DDT in Velsicol AR-50	4″ exhaust generator	0.1	Low *Tecoma* *Aster*	1.6	100	Routine 50 feet.
1 part 15 percent DDT in Velsicol AR-50 to 3 parts fuel oil.	do	.1	Medium-high *Nelumbo*	1.3	88	Routine 50 feet.
Do	do	.1	Low *Persicaria*	2.3	100 92	100 feet. 350 feet.
Do	6″ exhaust generator	.1	Low-medium *Tecoma* *Aster*	3.1	100	200 feet.
20 percent DDT in Velsicol AR-50	do	.08	Low *Persicaria*	2.7	100 84	180 feet. 300 feet.
20 percent DDT in Velsicol NR-70	do	.08	High *Nelumbo*	1.4	94	Routine. 100 feet.
20 percent DDT in Velsicol NR-70	do	.08	Medium-high *Nelumbo* *Saururus*	2.7	100 94	60 feet. 200 feet.
15 percent DDT emulsion [1]	do	.25	Medium-high *Saururus*	4.3	100	Routine. 50 feet.
15 percent DDT emulsion [1]	do	.14	Medium-high *Saururus*	3.1	100	Routine. 100 feet.
20 percent DDT in Velsicol NR-70	6″ generator with 2⅜ venturi	.12	Low *Aster*	4.7	96 82	150 feet. 350 feet.
20 percent DDT in Velsicol NR-70	do	.12	Heavy Woods, 100-feet trees	2.2	100	Routine. 100 feet.
20 percent DDT in Velsicol NR-70	do	.12	Medium-heavy *Ambrosia* *Andropogon*	4.9	99	250 feet.
20 percent DDT in Velsicol NR-70	do	.12	Medium-heavy *Ambrosia* *Andropogon*	10.5	99.7	Routine. 100 feet.

[1] Made from stock solution of 30 percent DDT in Velsicol NR-70 mixed in equal parts with water and emulsified with 2 percent Vatsol.

applied with the 6-inch generator gave very effective control of anopheline larvae (table 6), but in general it was not as satisfactory as the 4-inch generator.

In order to retain the low back pressure characteristics of the 6-inch generator and yet produce an aerosol with a higher prcentage of droplets with diameters in the 5- to 25-micron range, a venturi section was fitted to the end of the 6-inch pipe (fig. 4). This venturi was developed by the staff of the National Defense Research Committee Munitions Development Laboratory of the University of Illinois who cooperated with the Authority's staff in adapting it for use on the Stearman dusters and comparing its effectiveness with the straight exhaust generators. A report of these cooperative studies, including a detailed description of the venturi, has recently been submitted by LeTourneau et al. (*3*).

Two sizes of venturis were used: (1) a 2.38-inch throat giving a gas velocity of about 660 feet per second, and (2) a 1.9-inch throat giving a velocity of about 931 feet per second. The smaller venturi gave an unsatisfactory spray and developed too much back pressure; the larger venturi (2⅜-inch throat) was therefore adopted for use in more extensive tests. Using 20 percent DDT in Velsicol discharged through six $\frac{1}{16}$-inch jets, this generator produced an aerosol in which over 90 percent (by weight) of the droplets were between 5 and 100 microns in diameter and some 40 percent were between 5 and 50 microns in diameter. A small percentage of the material was in the size range of smoke particles so that the aerosol cloud was quite visible as it was discharged from the plane (fig. 5A). The aerosol was rapidly carried to the water surface by the down draft of the plane and penetrated vegetation very effectively (fig. 5B). Larval kills of 90 percent or better were obtained with this unit over swaths as wide as 300 feet at actual application rates as low as 0.04 pound DDT per acre. The results of four field tests with the venturi generator are given in table 6.

USE OF DDT AS AN ADULTICIDE

While conducting larvicidal experiments with DDT thermal aerosols attention was also given to the use of these materials as mosquito adulticides since promising results along this line had been reported by the Orlando laboratories and the Office of Scientific Research and Development groups from the University of Illinois and Columbia University. A series of field tests was run with the Stearman unit to determine the practicability of distributing DDT thermal aerosols by airplane for the control of *A. quadrimaculatus* adults. The criteria of effectiveness were mortality records of mosquitoes caged in the treatment areas and observations of adult *A. quadrimaculatus* in kegs, tree holes, and other natural resting places. The results of a series of these field tests are given in table 7. The data indicate that neither

TABLE 7.—*Effectiveness of DDT thermal aerosols distributed by airplane for the control of* Anopheles quadrimaculatus *adults, 1944* [1]

Description of generator	Material	Characteristics of aerosol	Approximate dosage (pounds DDT per acre)	Type of area	Control of adult *A. quadrimaculatus*: Kill in cages after 24 hours (percent)	Control of adult *A. quadrimaculatus*: Control in natural resting places
4-inch pipe; ⅛-inch unbaffled jet, 4 feet from manifold.	20 percent DDT in Velsicol NR-70.	Smoke and spray to 100 microns. Many 5- to 50-micron droplets.	0.15	Open	90 to 100	90- to 100-percent kill in 24 hours in covered kegs.
Do	do	do	.08	High dense woods	20 to 80	Natural population reduced 90 to 100 percent. None dead in covered kegs.
6-inch pipe; 5/32-inch baffled jet, 11 inches from manifold.	30 percent DDT in Velsicol NR-70.	Pure screening smoke	.85	do	None	No reduction in natural populations.
6-inch pipe; 5/32-inch baffled jet, 4 feet from manifold.	15 percent DDT emulsion.[2]	Smoke and fine to coarse spray.	.55	do	80 to 100	Natural population reduced 65 to 100 percent.
Do	do	do	.4	Very dense woods; trees 100 feet.	99	Natural population reduced 97 percent.
6-inch pipe with 2⅜-inch venturi; six 1/16-inch jets.	20 percent DDT in Velsicol NR-70.	50 percent of droplets 5- to 50-micron diameter.	0.4 to .5	Dense woods; trees 100 feet high.	80 to 100	Natural population reduced to zero.

[1] Modified from Le Tourneau et al., 1944.
[2] Made from stock solution of 30-percent DDT in Velsicol NR-70 mixed in equal parts and emulsified with 2-percent Vatsol.

coarse sprays nor fine screening smokes were as effective as the fine-spray aerosols in which a large percentage of the droplets was in the 5- to 50-micron range. This is in agreement with observations of Professor V. K. LaMer which show that the optimum droplet size for killing *Aedes aegypti* adults is with diameters of 10 to 15 microns (*3*).

The 6-inch exhaust generator with 2⅝-inch venturi appeared to be particularly satisfactory for the distribution of DDT thermal aerosols to control *A. quadrimaculatus* adults. This unit did not produce an objectionable back pressure as did the simple 4-inch generator and was highly effective in larvicidal as well as adulticidal operations. DDT applied in this manner at dosages of about one-half pound per acre appeared to give effective control of adult *A. quadrimaculatus* in their diurnal resting places. Excellent control of pest mosquitoes (*Aedes* and *Psorophora*) and other biting flies (*Chrysops* and *Tabanus*) was also obtained at this rate of application.

TOXICITY OF DDT TO FISH AND FISH FOOD ORGANISMS

One of the primary considerations involved in the introduction of a new mosquito larvicide is its effect upon other forms of wildlife, particularly fish and fish food organisms. With this in mind, some preliminary observations were made on the effect of DDT on wildlife. DDT dusts applied at rates of 0.1 pound DDT per acre gave no indication of injury to aquatic organisms other than mosquitoes, but 5-percent solutions of DDT in kerosene applied as sprays at rates of 0.1 to 0.25 pound DDT per acre were quite destructive to populations of aquatic insects living in close contact with the water surface, particularly Hemiptera and Coleoptera. Water boatmen (Corixidae) were especially susceptible to the DDT-oil sprays. Actual dipping records showed, however, that 20-percent solutions of DDT in Velsicol applied as thermal aerosols at rates of about 0.12 pound DDT per acre gave very efficient anopheline control without significant reduction of other aquatic organisms, such as mayfly larvae, midge larvae, beetle larvae, and water fleas (Cladocera).

SUMMARY AND CONCLUSIONS

Laboratory and field studies were conducted in the Tennessee Valley during 1943 and 1944 to provide information on the use of DDT as a residual house spray for the control of adult *A. quadrimaculatus* and on its effectiveness as an anopheline larvicide and adulticide when applied as a dust, a spray, or a thermal aerosol. The results of these investigations may be summarized briefly as follows:

1. Spray chamber tests indicated that the median lethal doses of DDT for adult *A. quadrimaculatus* males and females are about 7.0 and 12.0 mg. per 1,000 cubic feet, respectively, as compared with 1.0 and 1.5 mg. of pyrethrins.

2. Laboratory observations of wall board sprayed at rates of 40, 200, and 1,000 mg. of DDT per square foot showed that there was no significant difference in the initial toxicity to adult *A. quadrimaculatus* at the different dosages, the percent mortality being determined primarily by the period of contact. Residual toxicity, however, was dependent upon the rate of application, though not directly proportional to it; sufficient residual toxicity to produce 100 percent mortality to adults exposed for 60 minutes persisted for 4 to 16 weeks, depending on the dosage.

3. Wooden nail kegs treated with DDT at rates of 20, 200, and 2,000 mg. DDT per square foot retained a high residual toxicity to adult *A. quadrimaculatus* for 18 to 22 weeks; the exposure time required for a 100 percent knockdown during the first 18 weeks varied from about 1 to 6 hours, depending upon the dosage and the age of the treated surface.

4. Barns treated with DDT at a rate of about 200 mg. DDT per square foot remained almost entirely free of flies and mosquitoes for at least 11 weeks.

5. Unoccupied experimental houses treated with DDT at a rate of about 250 mg. DDT per square foot remained toxic to *A. quadrimaculatus* adults for at least 15 weeks; occupied dwellings lost their toxicity more rapidly than unoccupied houses but remained toxic to *A. quadrimaculatus* for at least 3 months.

6. The loss of residual toxicity by a DDT-treated surface appeared to be due primarily to the flaking off of DDT crystals. Smooth enameled or papered surfaces lost their toxicity more rapidly than rough wooden surfaces.

7. Observations in kegs, barns, and houses indicated that a DDT-treated surface exerts its repellent action as an irritant after the mosquitoes have been in actual contact with it for a short period; DDT residual sprays did not keep *A. quadrimaculatus* adults from entering houses, but they did prevent biting for a week or two and gave partial protection for as long as 8 or 10 weeks. Ninety-five to one hundred percent of the mosquitoes which escaped from a treated house had received a lethal dose of DDT before they left.

8. The pattern of reaction of *A. quadrimaculatus* adults to DDT-treated surfaces remained rather constant over a period of 15 weeks following treatment. Exposure to DDT surfaces completely reversed the normal light reactions of the mosquitoes, making them positively phototropic.

9. Solutions of 2.5 percent DDT in kerosene gave effective control of anopheline larvae when applied by boat oiling units at rates of approximately 0.1 pound DDT per acre, thereby making possible a reduction of about 98 percent in the amount of kerosene normally used.

10. DDT had to be diluted with 95 percent soapstone before a satisfactory airplane dusting mixture was obtained. With this mixture 90 percent control of *A. quadrimaculatus* larvae was obtained over 200-foot swaths at actual treatment rates as low as 0.05 pound per acre.

11. Certain polymethylnaphthalenes (Velsicols) having a high solubility for DDT and a high boiling point were found to be ideal solvents for making liquid solutions of DDT to be applied by airplane.

12. Stearman airplanes proved to be more satisfactory for applying DDT larvicidal sprays than Cub airplanes because of their greater pay load and increased swath width. Fifteen- to twenty-percent solutions of DDT in Velsicol applied with the Stearman unit at actual treatment rates as low as 0.03 pound DDT per acre gave at least a 90-percent kill of *A. quadrimaculatus* larvae over swath widths of 200 to 300 feet.

13. A Stearman airplane was equipped with various types of exhaust generators for producing thermal aerosols from concentrated solutions of DDT in Velsicol. The most satisfactory was one having a terminal venturi section with a 2⅜-inch throat. Thermal aerosols distributed with this unit at actual treatment rates as low as 0.04 pound DDT per acre gave at least 90-percent kills of anopheline

larvae over swaths as wide as 300 feet. Excellent control of *A. quadrimaculatus* adults in their diurnal resting places was also obtained with this unit at application rates of about 0.5 pound DDT per acre.

14. DDT dusts and thermal aerosols gave no evidence of injury to fish or other aquatic organisms when applied by airplane at rates of 0.1 pound DDT per acre. Five-percent solutions of DDT in kerosene applied at rates of about 0.25 pound DDT per acre were quite destructive to aquatic insects living in close contact with the water surface, particularly Hemiptera and Coleoptera.

ACKNOWLEDGMENTS

The writers wish to express their sincere thanks and appreciation to the many persons and agencies who have given advice and assistance in carrying out these studies.

Mr. E. F. Knipling and his staff at the Orlando laboratory of the United States Department of Agriculture deserve especial mention. It was through their suggestion that the Authority first initiated studies on DDT in the summer of 1943, and their continued cooperation and helpful advice have played an important part in the advancement of the DDT research program.

Other agencies which have provided assistance and information during the course of the studies include the National Defense Research Committee groups at the University of Illinois and at Columbia University; the Office of the Surgeon General of the United States Army; and the Office of Malaria Control in War Areas of the United States Public Health Service.

The following employees of the Tennessee Valley Authority deserve particular mention for their part in the studies: Dr. E. L. Bishop, for his enthusiastic support and coordination of the entire program; Mr. C. C. Kiker, Mr. C. W. Krusé, and Mr. Robert Sparkman, for developing special equipment and assisting with the engineering phases; Mr. Harold Scaton, for designing airplane equipment and piloting the experimental airplane; Miss Caroline Wilson, for technical assistance in the laboratory; Mr. Robert Crowell, for assistance in planning and carrying out the mosquito inspection service; and Mr. T. F. Hall and Mr. George G. Keener, for assisting in the collection of field data.

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COMMISSIONED CORPS OF PUBLIC HEALTH SERVICE TO BE BRANCH OF ARMED FORCES

The commissioned corps of the United States Public Health Service will become a branch of the land and naval forces of the United States under an executive order signed by President Truman on June 21. The order will be effective July 29 for the duration of the war.

Administration of the Public Health Service is not affected by the executive order. The Service continues to operate as a part of the Federal Security Agency. Public Health Service officers will be subject to the Articles for the Government of the Navy, with authority conferred by the Articles and by law on the Secretary of the Navy and the Commander of a fleet vested in the Federal Security Administrator and the Surgeon General of the Public Health Service. Officers of the Public Health Service on detail to the Army and Navy, however, will continue to be governed by the laws of the service to which they are assigned.

Under the executive order, commissioned officers of the Service will be subject to the same discipline and obligations and will have the same status as members of the Army, the Navy, and the Coast Guard. Their postwar status will be the same as that of all other veterans. The order also establishes uniformity in discipline and benefits among Public Health Service commissioned personnel. Up to the present, commissioned officers detailed to the Army, Navy, and Coast Guard, and all officers serving overseas have received full military benefits under the Public Health Service Act of 1944. The remainder of the corps has been entitled to only limited benefits. As a result, detail has determined the military status of Public Health Service officers, although the officers have no control over their detail, but perform the duties assigned them.

The commissioned corps totals 3,175, and is made up of physicians, dentists, sanitary engineers, pharmacists, scientists, and nurses. A large number of medical officers are engaged in direct care for the military forces. Practically all members of the corps are assigned to duties which have arisen directly out of the war effort. There is no enlisted personnel in the Public Health Service.

Since 1902, the President of the United States has been authorized by Congress to call upon the Public Health Service for direct military duty in time of threatened or actual war. In World War I, officers of the Service were made a part of the military forces by executive order. This action resulted from the realization that the close relationship between the Service and the military forces is not limited to individual officers detailed to the armed services, but extends to the Public Health Service as a whole.

The Public Health Service operates the medical services of the

Coast Guard in times of peace and war. The relationship of this service to the personnel of the Coast Guard is identical to the medical service supplied by the Bureau of Medicine and Surgery of the Navy to Navy personnel.

The text of the Executive Order of June 21, 1945, follows:

EXECUTIVE ORDER

DECLARING THE CNMMISSIONED CORPS OF THE PUBLIC HEALTH SERVICE TO BE A MILITARY SERVICE AND PRESCRIBING REGULATIONS THEREFOR

By virtue of the authority vested in me by section 216 of the Public Health Service Act, approved July 1, 1944, 58 Stat. 691; Title I of the First War Powers Act, approved December 1, 1941, 55 Stat. 838; and as President of the United States and Commander in Chief, I hereby declare the commissioned corps of the Public Health Service to be a military service and a branch of the land and naval forces of the United States during the period of the present war. The commissioned corps of the Public Health Service during such period shall be subject to the Articles for the Government of the Navy to the extent prescribed in the following regulations:

1. The Articles for the Government of the Navy are hereby adapted to apply to officers of the commissioned corps of the Public Health Service in the same manner and to the same extent as they apply to commissioned officers of the Navy under like circumstances.

2. Any member of the commissioned corps of the Public Health Service who violates any provision of the Articles for the Government of the Navy shall be subject to trial and punishment as prescribed therein. The authority conferred by the Articles for the Government of the Navy upon the Secretary of the Navy with respect to the convening of general courts-martial and courts of inquiry, the review of their proceedings and the confirmation, remission, mitigation, and execution of sentences of general courts-martial shall be vested in the Federal Security Administrator, and the authority conferred by law for such purposes upon the commander in chief of a fleet or squadron and other officers of the Navy shall be vested in the Surgeon General of the Public Health Service. The authority to convene a general court-martial or court of inquiry may not be delegated to any other officer of the Public Health Service.

3. The general courts-martial and courts of inquiry convened pursuant to this authority shall have the same powers and authority as other general courts-martial and courts of inquiry under the Articles for the Government of the Navy. The provision of Article 7 thereof shall apply in carrying out sentences of imprisonment and hard labor.

4. Commissioned officers of the Public Health Service now or hereafter detailed for duty with the Army, Navy, or Coast Guard shall be subject to the laws for the government of the service to which detailed as now prescribed by law. In the initiation, prosecution, and completion of disciplinary action, including remission or mitigation of punishments for any offense which has been or may be committed by any commissioned officer of the Public Health Service while detailed for duty with the Army, Navy, or Coast Guard, the jurisdiction shall depend upon and be in accordance with the laws and regulations applicable to the Army, Navy, Coast Guard, or Public Health Service, as the case may be, whichever has jurisdiction of the person of the offender at the various stages of such action: *Provided*, That any punishment imposed and executed in accordance with the provisions

of this paragraph shall not exceed that to which the offender was liable at the time of the commission of the offense.

5. Naval Courts and Boards, 1937 and modifications or revisions thereof, shall govern the conduct of general courts-martial and courts of inquiry in the Public Health Service.

6. This order shall be published in the Federal Register and shall be effective on and after the thirtieth day following the date of such publication.

THE WHITE HOUSE, *June 21, 1945.*

DEATHS DURING WEEK ENDED JUNE 9, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 9, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,890	8,360
Average for 3 prior years	8,588	
Total deaths, first 23 weeks of year	216,604	222,122
Deaths under 1 year of age	577	618
Average for 3 prior years	605	
Deaths under 1 year of age, first 23 weeks of year	14,174	14,396
Data from industrial insurance companies:		
Policies in force	67,354,290	66,602,953
Number of death claims	13,195	11,147
Death claims per 1,000 policies in force, annual rate	10.2	8.8
Death claims per 1,000 policies, first 23 weeks of year, annual rate	10.9	10.7

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JUNE 16, 1945

Summary

Only a slight increase occurred during the week in the incidence of poliomyelitis. A total of 96 cases was reported, as compared with 92 last week and a 5-year (1940–44) median of 42. Only 4 States reported more than 5 cases each (last week's figures in parentheses)—Texas 37 (42), New York 10 (11), Alabama 8 (2), and South Carolina 7 (3). Of the total of 999 cases reported to date, as compared with 657 for the same period last year and a 5-year median of 646, 198 were reported in Texas, 175 in New York, and 77 in California. Of the total of 602 cases reported during the 13-week period since March 17, the week of lowest reported incidence this year, 182 occurred in Texas, 78 in New York, and 41 in California.

A total of 133 cases of meningococcus meningitis was reported currently as compared with 143 for last week, 246 for the corresponding week last year, and a 5-year median of 64. Only 2 States reported more than 7 cases each (last week's figures in parentheses)—New York 18 (21), and Illinois 14 (10). The total to date this year is 5,151, as compared with 11,443 and 11,431, respectively, for the corresponding periods of the epidemic years of 1944 and 1943. The median number for the corresponding periods of the past 5 years is 1,855.

Cumulative totals for certain other diseases for the first 24 weeks of the year (figures for the corresponding period of last year in parentheses) are as follows: *Totals above last year's figures*—Diphtheria 6,347 (5,251), dysentery (all forms) 13,996 (10,229), leprosy 19 (15), Rocky Mountain spotted fever 113 (110), tularemia 376 (268), endemic typhus fever 1,364 (1,198), undulant fever 2,177 (1,484), whooping cough 60,055 (43,418). *Totals lower than last year's figures*—Anthrax 18 (19), infectious encephalitis 166 (265), influenza 65,147 (334,511), measles 83,539 (562,959), scarlet fever 123,662 (138,084), smallpox 235 (259), typhoid and paratyphoid fever 1,507 (1,900).

Deaths recorded during the week in 92 large cities of the United States aggregated 8,807, as compared with 8,852 last week, 8,267 for the corresponding week last year, and 8,152 for the 3-year (1942–44) average. The total for the year to date is 224,692, as compared with 229,646 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended June 16, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944	
NEW ENGLAND												
Maine	0	0	1	------	------	1	0	320	182	0	0	0
New Hampshire	0	0	0	------	------	------	0	10	10	0	0	0
Vermont	1	0	0	------	------	------	49	28	74	0	0	0
Massachusetts	3	1	2	------	------	------	359	656	1038	6	7	5
Rhode Island	1	0	0	26	14	------	7	14	130	0	2	1
Connecticut	0	0	0	2	2	1	99	296	246	1	4	1
MIDDLE ATLANTIC												
New York	19	7	13	[1] 1	[1] 3	[1] 1	200	1,028	1,028	18	23	11
New Jersey	3	2	2	1	------	3	73	547	1,267	5	11	6
Pennsylvania	5	5	11	1	1	------	562	365	466	6	19	4
EAST NORTH CENTRAL												
Ohio	7	4	3	9	11	11	90	318	318	5	14	3
Indiana	5	2	2	2	4	4	12	35	58	3	5	2
Illinois	5	6	16	1	2	5	352	190	223	14	15	3
Michigan [2]	15	5	3	3	------	1	213	258	793	6	11	1
Wisconsin	2	2	1	6	5	13	66	1,136	1,136	4	3	0
WEST NORTH CENTRAL												
Minnesota	1	3	1	------	------	1	11	146	146	3	4	0
Iowa	4	3	2	------	------	------	55	64	130	3	0	0
Missouri	6	2	2	3	1	1	34	42	67	5	11	3
North Dakota	3	0	1	------	------	------	2	2	17	0	0	0
South Dakota	0	0	0	------	------	------	6	16	16	0	1	0
Nebraska	2	0	0	1	2	------	13	25	25	0	0	0
Kansas	8	1	1	9	1	1	65	90	165	6	4	1
SOUTH ATLANTIC												
Delaware	1	0	0	------	------	------	1	1	4	0	0	0
Maryland [2]	15	3	3	2	9	1	25	78	116	2	6	6
District of Columbia	0	0	0	------	1	------	2	149	74	1	1	0
Virginia	4	6	5	41	22	34	16	190	156	7	3	3
West Virginia	3	2	2	3	3	3	17	88	32	2	2	0
North Carolina	6	5	5	------	3	------	28	365	251	5	8	2
South Carolina	3	1	6	112	97	105	17	165	74	1	4	0
Georgia	4	4	3	------	2	4	5	26	43	1	0	1
Florida	1	3	2	------	3	3	12	56	56	1	8	1
EAST SOUTH CENTRAL												
Kentucky	2	1	2	------	82	2	67	53	56	2	4	1
Tennessee	2	0	1	13	16	16	30	45	79	6	10	1
Alabama	3	0	1	10	4	14	7	45	45	0	5	1
Mississippi [2]	8	1	1	------	------	------	------	------	------	3	0	0
WEST SOUTH CENTRAL												
Arkansas	2	1	3	3	17	6	39	65	46	0	1	0
Louisiana	6	2	2	2	2	4	9	48	19	2	5	2
Oklahoma	6	0	2	2	32	13	11	113	45	2	2	1
Texas	31	28	21	336	203	203	320	739	489	3	8	4
MOUNTAIN												
Montana	2	1	1	6	------	------	4	38	50	1	0	0
Idaho	0	0	0	------	------	------	1	5	12	0	0	0
Wyoming	0	0	0	------	------	1	4	31	34	0	0	0
Colorado	3	6	8	42	3	14	4	87	94	1	2	0
New Mexico	3	2	2	3	1	------	11	44	44	0	0	0
Arizona	12	0	1	25	26	38	16	30	38	0	1	1
Utah [2]	0	0	0	------	------	------	136	41	79	0	0	0
Nevada	0	8	0	------	------	------	1	71	10	0	1	0
PACIFIC												
Washington	5	8	2	1	1	1	99	220	187	1	7	1
Oregon	2	3	2	2	6	6	57	79	85	1	2	0
California	20	25	16	20	15	40	1,075	2,729	809	6	32	3
Total	234	153	154	688	544	680	4,280	11,217	12,480	183	246	64
24 weeks	6,349	5,251	6,051	65,147	334,511	165,861	83,539	562,959	485,042	5,151	11,443	1,865

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended June 16, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944		June 16, 1945	June 17, 1944	
NEW ENGLAND												
Maine	0	0	0	30	18	8	0	0	0	0	1	1
New Hampshire	0	0	0	7	8	3	0	0	0	0	0	0
Vermont	1	0	0	14	4	3	0	0	0	0	0	0
Massachusetts	0	0	0	316	254	162	0	0	0	9	2	2
Rhode Island	0	0	0	24	9	9	0	0	0	0	0	0
Connecticut	2	1	0	42	39	45	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	10	3	2	563	251	288	0	0	0	3	4	7
New Jersey	2	0	1	88	126	126	0	0	0	1	0	2
Pennsylvania	2	1	1	308	204	186	0	0	0	2	2	9
EAST NORTH CENTRAL												
Ohio	1	2	0	190	667	142	1	0	1	1	5	4
Indiana	3	0	0	23	31	31	0	0	2	2	1	2
Illinois	0	0	1	202	100	100	0	0	2	0	0	5
Michigan [2]	0	1	1	233	113	129	0	0	0	0	2	1
Wisconsin	1	0	0	153	110	82	4	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	0	1	0	45	62	44	1	0	0	0	1	0
Iowa	0	0	0	25	21	21	0	0	1	0	0	0
Missouri	0	0	0	38	25	25	0	0	1	0	2	5
North Dakota	0	0	0	14	7	3	0	0	0	0	0	0
South Dakota	0	0	0	5	22	5	0	0	0	0	0	0
Nebraska	0	0	0	34	14	6	0	0	0	0	0	0
Kansas	0	1	1	49	33	23	1	0	0	0	2	2
SOUTH ATLANTIC												
Delaware	0	0	0	2	4	4	0	0	0	0	0	0
Maryland [2]	0	0	0	92	76	32	0	0	0	0	1	1
District of Columbia	0	0	0	25	24	10	0	0	0	0	0	1
Virginia	3	4	2	49	12	12	0	0	0	2	5	3
West Virginia	2	0	0	27	17	13	0	0	0	0	3	3
North Carolina	2	17	0	40	12	11	0	0	0	0	4	4
South Carolina	7	1	1	2	2	1	0	0	0	3	9	5
Georgia	2	0	0	10	13	7	2	0	0	10	7	10
Florida	0	5	1	5	5	1	0	0	0	4	4	4
EAST SOUTH CENTRAL												
Kentucky	0	3	1	24	10	21	0	0	0	7	5	2
Tennessee	3	2	1	33	16	17	0	1	1	6	6	3
Alabama	8	3	1	18	4	7	0	0	0	4	2	3
Mississippi [2]	0	2	0	3	2	2	0	2	0	3	4	2
WEST SOUTH CENTRAL												
Arkansas	1	2	2	10	4	4	0	0	0	11	4	5
Louisiana	1	5	2	14	2	3	0	0	0	6	7	7
Oklahoma	0	1	1	4	6	7	0	0	0	1	5	3
Texas	37	4	2	49	36	18	0	0	1	17	8	15
MOUNTAIN												
Montana	0	0	0	13	10	6	0	5	0	0	0	0
Idaho	0	1	0	9	7	5	0	0	0	1	0	0
Wyoming	0	0	0	3	11	7	0	0	0	0	0	0
Colorado	0	0	0	28	22	22	0	0	0	0	2	1
New Mexico	0	0	0	6	11	4	0	0	0	1	2	2
Arizona	0	2	0	9	11	5	1	0	0	3	3	1
Utah [2]	2	0	0	4	31	8	0	0	0	0	0	0
Nevada	0	0	0	0	1	0	0	0	0	1	0	0
PACIFIC												
Washington	0	0	0	43	81	21	1	0	0	3	0	0
Oregon	1	0	0	18	39	9	0	0	0	2	4	1
California	5	9	9	303	223	105	0	0	0	3	3	4
Total	96	71	42	3,246	2,810	2,081	11	8	25	106	110	118
24 weeks	999	657	646	123,662	138,084	89,533	235	259	560	1,507	1,900	2,057

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: Massachusetts 8; New York 1; New Jersey 1; South Carolina, 1; Georgia, 2; Florida, 1; Texas, 1; Washington, 2; Oregon, 2; California, 1.

Telegraphic morbidity reports from State health officers for the week ended June 16, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— June 16, 1945	Whooping cough: Week ended— June 17, 1944	Whooping cough: Median 1940–44	Week ended June 16, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever	Undulant fever
NEW ENGLAND											
Maine	44	17	20	0	0	0	0	0	0	0	1
New Hampshire	3	0	3	0	0	0	0	0	0	0	0
Vermont	17	10	15	0	0	0	0	0	0	0	3
Massachusetts	178	63	156	2	0	0	0	0	0	0	1
Rhode Island	14	16	20	0	0	0	0	0	0	0	0
Connecticut	39	43	44	0	0	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	203	165	259	4	20	0	3	1	0	1	4
New Jersey	130	60	110	0	0	0	0	2	0	0	1
Pennsylvania	179	63	237	1	0	0	0	0	0	0	7
EAST NORTH CENTRAL											
Ohio	121	99	172	0	0	0	0	0	0	0	3
Indiana	17	16	34	0	0	0	0	3	0	0	0
Illinois	54	33	96	0	1	0	0	0	2	0	15
Michigan [2]	44	66	237	3	1	0	0	0	0	0	14
Wisconsin	31	52	144	0	0	0	0	0	1	0	2
WEST NORTH CENTRAL											
Minnesota	12	14	25	2	1	0	0	0	0	0	4
Iowa	0	4	23	0	0	0	0	0	0	0	0
Missouri	15	37	37	0	0	0	0	0	0	0	2
North Dakota	0	1	2	0	0	0	0	0	0	0	1
South Dakota	2	13	3	0	0	0	0	0	0	0	0
Nebraska	2	12	11	0	0	0	0	0	0	0	0
Kansas	40	26	43	0	1	0	0	0	1	0	2
SOUTH ATLANTIC											
Delaware	0	0	1	0	0	0	0	0	0	0	0
Maryland [2]	69	57	76	0	0	0	0	[4] 2	0	0	0
District of Columbia	11	2	16	0	0	0	0	0	0	0	0
Virginia	71	92	92	0	0	8	0	3	0	0	0
West Virginia	16	15	31	1	1	0	0	2	0	0	1
North Carolina	188	166	168	0	1	0	0	1	0	2	0
South Carolina	61	145	131	1	46	0	0	0	0	4	0
Georgia	22	12	29	0	1	0	0	2	1	15	4
Florida	7	16	16	0	2	0	0	0	0	12	0
EAST SOUTH CENTRAL											
Kentucky	57	87	48	0	0	0	0	0	0	1	2
Tennessee	54	21	59	0	0	1	2	1	1	1	1
Alabama	44	23	51	0	0	0	0	0	1	3	3
Mississippi [2]	------	------	------	0	0	0	0	0	0	2	0
WEST SOUTH CENTRAL											
Arkansas	19	7	17	0	1	0	0	0	4	0	3
Louisiana	4	1	9	0	0	0	0	0	0	3	0
Oklahoma	10	36	27	1	2	0	0	1	0	0	1
Texas	297	199	261	14	492	36	0	0	0	49	25
MOUNTAIN											
Montana	2	18	16	0	0	0	2	0	0	0	0
Idaho	3	0	1	0	2	0	0	0	0	0	0
Wyoming	9	6	3	0	0	0	0	2	0	0	0
Colorado	16	13	18	0	0	0	0	1	1	0	0
New Mexico	6	3	13	1	0	3	0	0	0	0	0
Arizona	4	4	23	0	0	21	1	0	0	0	0
Utah [2]	52	52	91	0	0	0	0	0	1	0	1
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	14	19	40	0	0	0	0	0	0	0	1
Oregon	15	7	27	0	0	1	0	1	0	0	7
California	422	104	292	2	3	0	2	0	0	1	4
Total	2,618	1,915	3,721	32	575	70	10	22	13	94	115
Same week, 1944	1,915	------	------	31	745	213	9	21	11	97	69
Average, 1942–44	3,326	------	------	48	527	165	7	[5] 18	22	[5] 70	------
24 weeks, 1945	60,055	------	------	743	10,493	2,760	166	[4] 13	376	1,364	2,177
24 weeks, 1944	43,418	------	------	622	7,485	2,122	265	110	268	1,198	1,484
Average, 1942–44	77,607	------	[5] 91,802	632	5,082	1,607	246	[5] 139	388	[5] 896	------

[2] Period ended earlier than Saturday.
[4] Delayed report: Maryland 1 case.
[5] 5-year median, 1940–44.

Psittacosis: Pennsylvania 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 9, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	1	1	0	4	0	0	3
New Hampshire:												
Concord	0	0	------	0	5	0	0	0	0	0	0	0
Vermont:												
Barre	0	0	------	0	34	0	0	0	1	0	0	1
Massachusetts:												
Boston	0	0	------	0	143	4	14	0	65	0	0	54
Fall River	0	0	------	0	1	0	1	0	5	0	0	0
Springfield	0	0	------	0	0	0	0	0	15	0	0	0
Worcester	0	0	------	0	39	0	4	0	11	0	0	6
Rhode Island:												
Providence	0	0	------	0	11	1	2	0	2	0	0	16
Connecticut:												
Bridgeport	0	0	------	0	0	0	1	0	4	0	0	0
Hartford	0	0	------	0	32	0	1	0	11	0	0	0
New Haven	0	0	------	0	1	0	0	0	1	0	0	8
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	6	1	4	3	8	0	0	0
New York	5	0	2	2	87	11	50	4	248	0	4	72
Rochester	0	0	------	1	21	1	3	2	16	0	2	12
Syracuse	0	0	------	0	0	0	2	0	1	0	0	34
New Jersey:												
Camden	1	0	------	0	6	0	1	0	3	0	0	0
Newark	0	0	1	0	6	0	6	0	17	0	0	9
Trenton	0	0	------	0	3	0	0	0	1	0	0	5
Pennsylvania:												
Philadelphia	2	0	------	0	469	4	24	0	90	0	0	82
Pittsburgh	0	0	------	0	2	4	5	0	31	0	0	13
Reading	0	0	------	0	1	0	1	0	25	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	9	0	4	0	12	0	0	16
Cleveland	2	0	1	0	15	4	8	0	48	0	0	36
Columbus	0	0	------	0	2	0	2	0	17	0	0	7
Indiana:												
Fort Wayne	0	0	------	0	0	0	0	0	3	0	0	0
Indianapolis	1	0	------	0	15	0	4	0	14	0	0	5
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	1	0	1	0	0	1
Illinois:												
Chicago	1	0	------	0	228	11	29	0	105	0	1	25
Springfield	0	0	------	0	3	0	0	0	2	0	0	0
Michigan:												
Detroit	7	1	------	0	141	1	4	0	79	0	0	12
Flint	0	0	------	0	7	0	1	0	24	0	0	2
Grand Rapids	0	0	------	0	4	0	0	0	9	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	10	0	0	0	2	0	0	2
Milwaukee	0	0	------	0	40	2	2	0	61	0	0	0
Racine	0	0	------	0	0	0	0	0	6	0	0	6
Superior	0	0	------	0	1	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	2	0	9	0	0	0
Minneapolis	0	0	------	0	12	1	5	0	36	0	0	9
St. Paul	1	0	------	0	2	0	2	0	4	0	0	1
Missouri:												
Kansas City	0	0	------	1	12	0	5	0	7	0	0	2
St. Joseph	0	0	------	0	1	0	0	0	5	0	0	0
St. Louis	1	0	4	1	14	5	4	0	21	0	0	15

City reports for week ended June 9, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	1	1	3	0	15	0	0	0
Kansas:												
Topeka	0	0	------	0	1	0	0	0	4	0	0	0
Wichita	0	0	------	0	0	1	2	0	6	0	0	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	2	0	0	0	0	0
Maryland:												
Baltimore	9	0	------	0	1	0	7	0	60	0	0	73
Cumberland	0	0	------	0	0	0	1	0	5	0	0	1
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	2	1	9	0	21	0	0	3
Virginia:												
Lynchburg	0	0	------	0	2	0	0	0	1	0	0	1
Richmond	0	0	------	0	9	0	1	1	3	0	0	0
Roanoke	0	0	------	0	0	0	0	0	1	0	0	0
West Virginia:												
Wheeling	0	0	------	0	2	1	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	1	0	0	0	0	0	0	6
Wilmington	0	0	------	0	2	0	1	0	1	0	0	6
Winston-Salem	0	0	------	0	0	1	1	0	2	0	0	12
South Carolina:												
Charleston	0	0	1	0	1	0	0	0	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	3	0	1	0	0	0
Brunswick	0	0	------	0	0	0	2	0	0	0	0	0
Savannah	0	0	------	0	0	0	2	0	1	0	0	1
Florida:												
Tampa	0	0	------	0	0	0	3	1	0	0	3	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	1	13	0	10	1	6	0	0	5
Nashville	0	0	------	2	0	0	3	0	1	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	0	1	1	1	0	0	1
Mobile	1	0	1	0	0	0	3	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	5	0	2	0	0	0	0	0
Louisiana:												
New Orleans	1	1	1	0	11	0	4	1	12	0	0	2
Shreveport	0	0	------	0	0	0	2	0	0	0	0	0
Texas:												
Dallas	1	0	------	0	8	0	1	0	5	0	0	10
Galveston	0	0	------	0	0	0	0	0	0	0	0	0
Houston	0	0	------	1	2	0	4	10	3	0	0	0
San Antonio	0	0	------	0	3	0	3	2	1	0	1	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	2	0	0	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	3	0	2	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	16	1	4	0	4	0	11	0	0	16
Pueblo	0	0	------	0	0	0	1	0	2	0	0	1
Utah:												
Salt Lake City	0	0	------	0	92	0	2	0	4	0	0	3

City reports for week ended June 9, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	1	33	0	4	0	7	0	0	1
Spokane	0	0	1	1	1	0	2	0	1	0	0	0
Tacoma	2	0	------	0	46	0	1	0	3	0	0	5
California:												
Los Angeles	2	0	2	0	71	1	2	0	43	0	0	55
Sacramento	2	0	------	0	27	0	2	0	25	0	0	4
San Francisco	0	0	------	0	196	2	6	2	32	0	0	13
Total	40	2	30	13	1,921	59	289	28	1,306	0	11	677
Corresponding week, 1944	47	------	22	14	3,027	------	262	------	1,003	0	15	335
Average, 1940-44	58	------	42	[1] 13	[2] 4,362	------	[1] 283	------	1,002	1	21	1,041

[1] 3-year average, 1940-42.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York 3; Detroit 1; St. Louis 1; Los Angeles 1.
Dysentery, bacillary.—Cases: Buffalo 2; New York 13; Detroit, 1; Charleston, S. C., 30.
Dysentery, unspecified.—Cases: Baltimore 1; Richmond 1; San Antonio, 27.
Typhus fever, endemic.—Cases: Wilmington, N. C., 1; Savannah 3; Tampa 1; Birmingham 3; Mobile 2; New Orleans 1; Shreveport 1; Dallas 1; Houston 3; San Antonio 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,289,700)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	0.0	0.0	695	15.7	62.7	0.0	311	0.0	0.0	230
Middle Atlantic	3.7	0.0	1.4	1.4	278	9.7	44.4	4.2	204	0.0	2.8	105
East North Central	6.7	0.6	0.6	0.6	289	10.9	33.4	0.0	234	0.0	0.6	69
West North Central	6.0	0.0	8.0	4.0	86	16.1	46.3	0.0	215	0.0	0.0	58
South Atlantic	15.1	0.0	1.7	0.0	35	5.0	53.6	3.3	161	0.0	5.0	172
East South Central	5.9	0.0	5.9	17.7	77	0.0	100.3	11.8	53	0.0	0.0	35
West South Central	5.7	2.9	2.9	2.9	83	0.0	45.9	37.3	60	0.0	2.9	37
Mountain	0.0	0.0	127.1	7.9	786	0.0	71.5	0.0	151	0.0	0.0	159
Pacific	9.5	0.0	4.7	3.2	591	4.7	26.9	3.2	176	0.0	0.0	123
Total	6.1	0.3	4.6	2.0	293	9.0	44.1	4.3	199	0.0	1.7	103

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—April 1945.—During the month of April 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	14				11		2		27	
Diphtheria	6								6	
Dysentery:										
Amebic	5				1		6	1	12	1
Bacillary	1		1		1		2		5	
Leprosy						2	1		1	2
Malaria [1]	5				48	1	72	3	125	4
Measles					7		1		8	
Paratyphoid fever			1		1				2	
Pneumonia		4		2	13	1			[2] 13	7
Poliomyelitis						1				1
Tuberculosis		16		2	9	1		8	[2] 9	27
Typhoid fever			2				1		3	
Whooping cough				1	1				[2] 1	1

[1] 19 recurrent cases.
[2] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended May 26, 1945.—During the week ended May 26, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		38	1	239	231	47	11	49	95	711
Diphtheria		9	5	37	4	6				61
Dysentery, bacillary									1	1
German measles		1		8	41	5	3	23	55	136
Influenza		63			67	2			61	193
Measles		6		146	230	37	66	49	359	893
Meningitis, meningococcus				3	3			1	2	9
Mumps		4		182	87	23	8	87	29	420
Poliomyelitis					1					1
Scarlet fever		2	14	73	60	16	4	28	17	214
Tuberculosis (all forms)		3	4	97	39	11	4	11	75	244
Typhoid and paratyphoid fever				12	1	1	1	1	1	17
Undulant fever				6					3	9
Venereal diseases:										
Gonorrhea		13	5	73	124	48	22	39	52	376
Syphilis		11	4	107	69	9	4	5	22	231
Whooping cough		8		193	42		5		9	257

JAMAICA

Notifiable diseases—4 weeks ended June 2, 1945.—During the 4 weeks ended June 2, 1945, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	1		Leprosy		4
Chickenpox	25	41	Tuberculosis	43	54
Diphtheria	7	2	Typhoid fever	8	114
Dysentery	7	8	Typhus fever	2	1
Erysipelas	2	1			

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Plague

Morocco (French).—For the period May 25–31, 1945, 72 cases of plague were reported in French Morocco.

Peru.—During the month of April 1945, plague was reported in Peru by Departments as follows: Ica, 1 case, 1 death; Libertad, 2 cases; Lima, 2 cases; Piura, 1 case. One case of suspected plague was also reported in the Department of Cajamarca, Peru.

Smallpox

Sudan (French).—For the period May 21–31, 1945, 110 cases of smallpox were reported in French Sudan.

Typhus Fever

Iraq.—For the week ended June 9, 1945, 13 cases of typhus fever were reported in Iraq.

Mexico—Nuevo Laredo.—A telegraphic report dated June 19, 1945, states that 18 cases of endemic typhus fever with 1 death have occurred in Nuevo Laredo, Mexico.

Morocco (French).—For the period May 25–31, 1945, 246 cases of typhus fever, including 8 cases in Casablanca and 2 cases in Rabat, were reported in French Morocco.

Turkey.—For the week ended June 9, 1945, 66 cases of typhus fever were reported in Turkey, including 1 case in Adana, 3 cases in Istanbul, and 6 cases in Zonguldak.

Yellow Fever

Gold Coast—Takoradi.—On June 8, 1945, 1 fatal case of yellow fever was reported in Takoradi with the place of onset as Nsuta, Gold Coast.

COURT DECISION ON PUBLIC HEALTH

Hotels—regulation.—(Arkansas Supreme Court; *City of Texarkana* v. *Brachfield*, 183 S.W.2d 304; decided October 23, 1944, as amended on denial of rehearing December 4, 1944.) In this case one of the conclusions reached by the Supreme Court of Arkansas was that a city of the first class in the State had, under an 1885 statute (Pope's Digest, section 9944), the power to regulate hotels, the limit of the power being the protection of the morals, health, and safety of the city. In this connection the court cited in its opinion a later statute (Act 210 of 1917) which empowered the State board of health to promulgate sanitary rules for hotels and to have some form of inspection. While, according to the court, such 1917 law did not take away from first-class cities the power over hotels as allowed by section 9944, it was pointed out that the rules and inspections made by the State board of health, within the scope of the purpose in view when the 1917 act was passed, were superior to any municipal regulation, since the State board of health authority was the latest legislative expression.

The court referred to an Indiana case in which the supreme court of that State pointed out that the action of the State legislature in empowering the State board of health to regulate tourist courts did not take away from a municipality the right also to establish reasonable regulations for the protection of the health and safety of the municipality's citizens so long as the municipal regulations were not contrary to the State board of health regulations. Said the Arkansas Supreme Court: "We subscribe to the same holding."

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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STUDIES IN CONNECTION WITH THE SELECTION OF A SATISFACTORY CULTURE MEDIUM FOR BACTERIAL AIR SAMPLING [1]

By ROY SCHNEITER, *Bacteriologist*, JOHN E. DUNN, *Surgeon*, and BARBARA H. CAMINITA, *Assistant Bacteriologist, United States Public Health Service*

INTRODUCTION

During the past decade interest has been revived and marked progress attained in the study of air-borne infections. The revival of interest in this field has been stimulated by the development of the air centrifuge (*1*) as a new practical method for the quantitative bacteriologic examination of the air, and by the recognition of the role played by droplets, droplet nuclei (*2, 3, 4*), and dust (*5, 6, 7, 8*) in transmission of air-borne infection (*5*). Extensive studies have been conducted on the three principal phases of the problem of air-borne infection: (1) Establishment of an index of bacterial air pollution (*5, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18*); (2) methods of air sampling, i. e., detection of bacterial air pollution (*20, 21*); and (3) physical and chemical methods of rendering air noninfectious, i. e., control of air-borne infection (*5, 19*). The results presented herein are part of a series of studies now in progress on all three phases of the problem.

In the detection of air pollution most attention has been given to the development of sampling devices (*20, 21*) and comparison of their efficiency without adequate consideration of the factors involved in the selection of satisfactory culture media for this purpose. The culture medium employed for bacterial air sampling should be especially favorable to the growth of the micro-organisms which are of particular significance in the atmospheres to be investigated. In sampling the air of food and beverage manufacturing plants, for example, the culture medium employed should be selective for yeasts, molds, or other resistant spoilage types of micro-organisms economically important to that industry.

Since respiratory tract infections constitute the predominant type of air-borne diseases, it would seem logical to select a culture medium

[1] From the Industrial Hygiene Research Laboratory, National Institute of Health. Presented before the Laboratory Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., Oct. 5, 1944.

capable of demonstrating the greatest diversity and incidence of micro-organisms from the respiratory tract. However, the majority of the workers in this field have employed only so-called nutrient agar or meat infusion agar with or without the addition of blood. Occasionally the use of selective media has been reported for this purpose (*9, 16, 17, 18, 23, 24, 25, 26, 29*), or for the isolation of *Streptococcus salivarius* from other sources (*22, 27, 28, 30*), but, except for a few instances, formulae for the exact composition of these media were not given. Unless the exact composition of a medium, as well as the exact designation of each ingredient, particularly the peptones, is known, that medium cannot be used by other investigators hoping to obtain comparable results or to duplicate their own results.

It is felt therefore that the type of culture medium employed in bacterial air sampling is of fundamental importance and that it should meet the following requirements: (1) Possess selectivity for fastidious micro-organisms from the respiratory tract, (2) inhibit nonsignificant saprophytes which interfere with accurate bacterial counts, and (3) have a standard composition, thus enabling other workers to employ identical culture media under similar conditions.

The experimental studies included in this report were undertaken in a search for such a medium as well as to obtain more information on some of the factors which influence the selection of the medium.

EXPERIMENTAL

Bacterial air pollution may be evaluated in two ways: (1) On the basis of total numbers of bacteria present and (2) on the basis of the presence of one type of organism considered to be an index of pollution, much as the coliform group of bacteria is used as an index of water pollution.

The method may consist in collecting air samples directly on a solid culture medium by means of an impingement device (*21*), or with an atomizing device (*21*) by means of which air is introduced into a liquid substrate which is later plated on a solid medium or is redistributed by the dilution method into a series of sterile tubes for incubation. In the latter procedure, the incidence of a given type of micro-organism is determined on the basis of most probable numbers followed by confirmation of colonies on a selective solid medium (*16*). While this latter method is entirely valid and has certain advantages from the standpoint of accuracy, it is not so well adapted for field work or for quick results. Since the use of solid media has a wider field of application, this type of media only will be considered in this study.

Gordon (*9*) in 1902–03 proposed the hypothesis and offered supportive evidence that air contamination by humans consists primarily of micro-organisms prevalent in the upper respiratory tract, namely, streptococci, and particularly *Str. salivarius*. He suggested the

utilization of this organism as an index of human air pollution. Gordon's work has been corroborated by subsequent workers (*10, 11, 12, 13, 14, 15, 16, 17, 18*).

Comparison of media for the isolation and growth of streptococci and other air-borne organisms.—Since a comparatively limited number of studies have been reported on the development of selective culture media for the detection of nasopharyngeal contamination of the air, it was decided to preface this investigation with a comparison of media recommended or known to be adapted to this purpose.

Twelve media used for air sampling by previous investigators (*17, 23, 24, 25, 26, 31*), or known to be particularly favorable to the growth of streptococci (*28*) were examined by plating suitable dilutions of test organisms as follows:

Sixteen- to eighteen-hour neopeptone broth [2] cultures of *Str. salivarius* No. 7961 or No. 7996, American Type Culture Collection, *Streptococcus pyogenes* and *Streptococcus viridans*, National Institute of Health, *Staphylococcus albus*, United States Food and Drug Administration, and a sporulating bacillus isolated from the air were diluted 1:100 in sterile physiological saline and a loopful of this dilution was plated in duplicate on each test medium plus 5 percent sterile defibrinated sheep blood. Plates were incubated 40 hours at 37° C. and examined at 24 and 40 hours for number and size of colonies.

The media tested were:

Tryptose agar (31).—Bacto-tryptose, 20 gm.; NaCl, 5 gm.; bacto-dextrose, 1 gm.; bacto-agar, 25 gm.; distilled water, 1,000 ml.; pH, 6.9. This medium is recommended for the cultivation of pathogenic organisms, especially *Brucella* and the streptococci.

Tryptose agar without dextrose.—Omit dextrose from above formula.

Beef heart hormone agar.—Beef heart infusion, 1,000 ml. (from 500 gm. beef heart per liter); neopeptone, Difco, 10 gm.; NaCl, 5 gm.; bacto-agar, 25 gm.; pH 7.4–7.5. This medium was used by Torrey and Lake (*17*) to recover streptococci from air.

Maltose agar.—Neopeptone, Difco, 10 gm.; NaCl, 8.5 gm.; glucose, 0.5 gm.; bacto-agar, 25 gm.; maltose, 10 gm.; distilled water, 1,000 ml.; pH 7.6. This medium was recommended by Simmons and Wilson (*26*) as a presumptive test medium for β-hemolytic streptococci.

Garrod's medium (23, 24, 25).—Bacto-beef extract, 3 gm.; bacto-peptone, 1 gm.; potassium tellurite, 0.5 gm.; crystal violet, 0.002 gm.; bacto-agar, 25 gm.; distilled water, 1,000 ml.; pH 7.4. This is an approximation of the medium which Garrod called "ox-heart extract peptone agar." He added 5 percent horse blood to the medium.

Garrod's medium with salicin (23).—Same formula as above but with 10 gm. of salicin added per liter.

Veal infusion agar.—Veal infusion, 1,000 ml. (from 500 gm. ground lean veal); bacto-peptone, 10 gm.; NaCl, 5 gm.; bacto-agar, 25 gm.; pH 7.3. This is a medium commonly used as a blood agar base for isolating streptococci from milk.

Purple lactose agar.—Beef infusion, 1,000 ml. (from 500 gm. beef per liter); bacto-peptone, 5 gm.; bacto-lactose, 10 gm.; bacto-agar, 25 gm.; bacto-bromcresol purple, 0.025 gm.; pH 6.8. This medium was tested to see whether it was suitable for the growth of acid-producing streptococci.

[2] Meat infusion, 1,000 ml. from 500 gm. meat; neopeptone, Difco, 10 gm.; NaCl, 5 gm.; pH, 7.4±.

Nutrient agar, 2.5 percent (31).—Bacto-beef extract, 3 gm.; bacto-peptone, 5 gm.; NaCl, 8.0 gm.; bacto-agar, 25 gm.; distilled water, 1,000 ml.; pH 6.4.

Meat infusion agar.—Meat infusion, 1,000 ml. (from 500 gm. meat); bacto-peptone, 5.0 gm.; NaCl, 8.5 gm.; bacto-agar, 18 gm.; pH 6.8. Ordinarily beef would be employed but for this medium only horse meat was available. It proved to be satisfactory.

Rose and Georgi's medium (28).—Proteose peptone, Difco, 5 gm.; bacto-yeast extract, 5 gm.; bacto-beef extract, 3 gm.; glucose, CP, 10 gm.; sodium azide (1 percent aqueous), 20 ml.; distilled water 1,000 ml.; pH 7.2. The sodium azide was made up separately, sterilized, and added to the medium just before use. For these studies the medium was modified by the addition of 18 gm. bacto-agar per liter. This medium was recommended for recovery of *Str. salivarius* from eating utensils.

Proteose extract agar.—Proteose peptone No. 3, Difco, 20 gm.; bacto-beef extract, 3 gm.; bacto-yeast extract, 3 gm.; malt extract, Difco, 3 gm.; bacto-dextrose, 5 gm.; NaCl, 8.5 gm.; bacto-agar, 25 gm.; pH 6.8. This is a modification of a medium submitted to this laboratory for experimental testing by the Difco Laboratories, Inc., Detroit, Mich. It was labelled "Anaerobe Medium with Dextrose" and, according to the Difco Laboratories, it had been developed for the growth of fastidious anaerobic micro-organisms to which it was particularly well adapted. It also had been found to be an excellent medium for strict and facultative aerobes.

The original "anaerobe medium with dextrose," containing only 0.1 gm. of agar per liter and no sodium chloride, was found to support an excellent growth of streptococci. It was modified by the addition of more agar and of NaCl to prevent hemolysis and employed throughout these studies under the name of "proteose extract agar."

The concentration of agar in the media for these preliminary experiments was usually 2.5 percent, the amount recommended for use with the Wells air centrifuge (*1*).

Streptococcus hemolyticus, *Str. viridans*, *Str. salivarius*, *Staph. albus*, and the sporulating bacillus grew best on proteose extract agar, beef heart hormone agar, tryptose dextrose agar, and tryptose agar. The other media tested were less favorable to the growth of the streptococci than these four.

The maltose agar (*26*), despite its strong recommendation for the growth of streptococci and the fact that it appeared to inhibit the spreading growth of the sporulate, a property which has given considerable trouble in air-sampling studies, was distinctly less favorable to the growth of the streptococci. Rose and Georgi's medium (*28*), which was tested only with *Str. salivarius*, could not compare, either in number or size of colonies produced, with the proteose extract agar or tryptose dextrose agar.

The addition of 0.5 ml. of sterile defibrinated sheep blood to every 10 ml. of medium tended to improve the growth of the streptococci on all media except the purple lactose agar to which blood was never added.

The addition of 0.002 gm. (1 : 500,000) of crystal violet (bacto-crystal violet DC-1, actual dye content 92 percent, CI No. 681, Lot

No. 291853) to each liter of media Nos. 1 to 7 and 12, before sterilization, materially reduced the growth of all the organisms tested.

For further comparative studies proteose extract agar, tryptose dextrose agar, and meat infusion agar were selected. The first two are obtainable commercially, and their exact composition and ability to grow fastidious micro-organisms is known. The meat infusion agar, although of indefinite composition, most nearly approximated the "nutrient agar" reported as used by so many previous investigators.

Influence of the concentration of agar employed in media for air sampling.—The concentrations of agar employed in air-sampling media have ranged from 1.5 to 2.5 percent. However, 2.0 to 2.5 percent have been employed by most workers for this purpose. Apparently the primary reasons for using higher concentrations of agar than usual for bacteriological plating media are to obtain a more stable medium capable of withstanding the impingement action from a rapidly flowing air stream, and to provide a more dehydrated medium which would retard the development of sporulating aerobic spreaders.

Since increasing the concentrations of agar in a plating medium results in its dehydration to a degree that may render it inhibitory to the development of fastidious types of micro-organisms, it seemed advisable to ascertain the concentration of agar which would provide a medium that would be stable when used with all types of impingement air-sampling devices and at the same time would offer suitable conditions for the development of maximum numbers and types of bacteria.

The first series of experiments was designed to ascertain the minimum concentration of agar necessary to produce a stable medium, and particularly a medium for use with the impingement sampling devices. Proteose extract agar was employed as the basic medium throughout these experiments, the only variable being the concentration of agar. Experimental lots of the medium were made up to contain 1.5, 1.8, 2.0, and 2.5 percent agar.

The devices used for collecting air samples are of two types: impingment devices (*21*) in which air-borne micro-organisms are impinged upon the surface of a solid culture medium and atomizing devices in which air is finely atomized into a liquid medium. The primary advantage of employing an impingement device lies in the fact that samples may be immediately incubated and the colony count determined without further manipulation of the sample. The air samples taken in the liquid medium of the atomizing devices are subsequently plated out or redistributed in replicate sterile tubes by the dilution method.

The impingement devices used included the air centrifuge (*1*), bottle device (*32*), slit device (*20*), funnel device (*33*), sieve device

(*34*), and exposed agar plate. The bubbler flask (*35*) was the only atomizing type of device used. Air samples were collected simultaneously where possible by the seven devices, each impingement device sampling on the culture medium containing one concentration of agar. The bubbler flask device contained proteose extract enrichment broth [3] into which the air samples were atomized and subsequently this broth-sampling medium was plated in quintuplicate on the basic medium containing each percentage concentration of agar.

All samples were incubated at 37° C. for 48 hours. Some of the air-centrifuge sample tubes were incubated horizontally, whereas others were incubated vertically, in order to provide the most stringent conditions for testing the stability of the medium. Since it was found impossible, under the conditions of the experiment, to collect identical or uniform air samples with each device, only the results bearing on the stability of the medium are presented. These results are summarized in table 1.

TABLE 1.—*Stability of culture medium containing various concentrations of agar used with different air-sampling devices*

Air-sampling device or method	Concentrations of agar in medium											
	1.5 percent			1.8 percent			2.0 percent			2.5 percent		
	Total samples tested	Total samples stable	Total samples unstable	Total samples tested	Total samples stable	Total samples unstable	Total samples tested	Total samples stable	Total samples unstable	Total samples tested	Total samples stable	Total samples unstable
Wells air centrifuge:												
Tubes incubated vertically	5	2	3	6	3	3	5	2	3	5	5	0
Tubes incubated horizontally	11	8	3	6	6	0	11	11	0	11	10	1
Bottle device	12	11	1	6	6	0	12	12	0	12	12	0
Slit device	25	25	0	12	12	0	24	24	0	24	24	0
Funnel device	25	25	0	6	6	0	24	24	0	24	24	0
Sieve device	33	33	0	189	189	0	33	33	0	33	33	0
Exposed petri plate method	51	51	0	72	72	0	48	48	0	49	49	0
Bubbler flask device	[1] 56	[2] 55	[3] 1	[4] 167	[4] 167	0	[1] 56	[1] 56	0	[1] 56	[1] 56	0

[1] 280 plates. [2] 278 plates. [3] 2 plates. [4] 2,650 plates.

The total air samples collected with each device, on each concentration of agar, the total samples in which the medium remained stable during sampling and incubation, and the total samples in which the medium was of inadequate stability are shown in the table. The stability of the medium was considered to be inadequate if any degree of slippage or physical disintegration occurred during the sampling process or incubation period.

It was found that a medium with an agar concentration of 1.5 percent possessed adequate stability for use with all devices except the air centrifuge.

[3] Same formula as proteose extract agar with agar omitted.

The medium containing 1.8 percent agar possessed adequate stability for use with all sampling devices. Slippage or disintegration of this agar occurred only in the air centrifuge tubes incubated in a vertical position.

Aerobic sporulating spreaders frequently obscured counts in air samples regardless of the concentration of the agar employed in the medium.

From the results obtained it was concluded that a solid medium containing an agar concentration of 1.8 percent possesses adequate stability for use with all types of air sampling devices and that higher concentrations of agar are not justified from the standpoint of spreader control, especially since there are other more promising methods for accomplishing this purpose.

A second series of experiments was carried out in order to determine the effect of the concentration of agar on the growth and development of bacteria contained in air samples. The bubbler flask air-sampling device (*35*) was employed in these studies. This device (fig. 1) consists of a 250-ml. suction flask, closed with a one-hole rubber stopper through which passes a glass tube open at one end

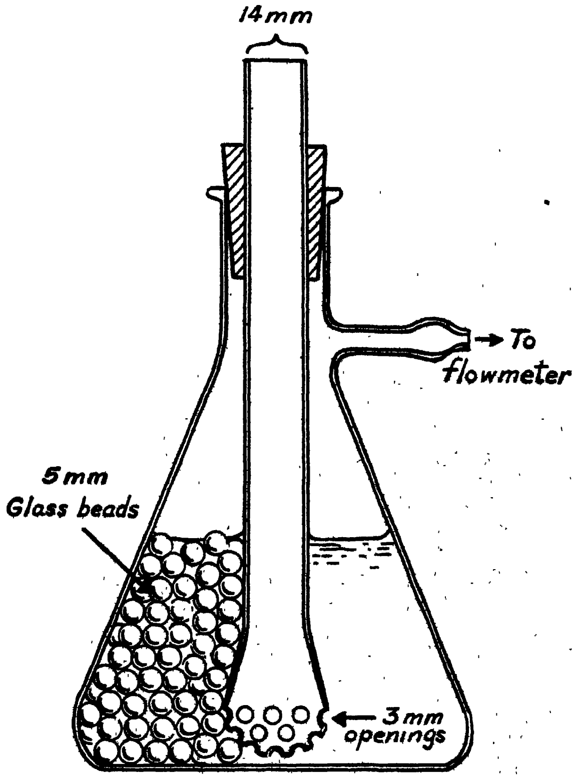


FIGURE 1.—Bubbler flask air-sampling device.

and with a pear-shaped perforated bubbler bulb at the other. The pear-shaped end reaches the bottom of the flask and is surrounded by 200 gm. of solid glass beads (5 mm.) and 50 ml. of enrichment broth.[4] Five drops of olive oil are added to each flask before sterilization in order to reduce foaming. When air samples are collected, the air enters through the perforated bulb and is atomized into the liquid at the approximate rate of 1.0 cu. ft. per minute.

Forty-eight air samples were collected with this device in a room occupied by experimental animals. Each sample flask was thoroughly agitated and then inoculated in quintuplicate into plates of proteose extract agar containing 1.5, 1.8, 2.0, and 2.5 percent agar, respectively, i.e., five plates of medium containing each concentration of agar were inoculated with 1.0 ml. of broth from each sample. All plates were incubated at 37° C. for 48 hours. The colony counts per cubic foot of air were determined by totaling the counts obtained on the five plates containing each concentration of agar, multiplying the total count (five plates) by a corrected factor of approximately 10, and dividing the result by the volume of air sampled (5 or 10 cu. ft.). The corrected factor was obtained by determining the weight of broth (1.0 gm.=1.0 ml.) lost from the flask during sterilization and sampling and dividing the remaining volume of broth by 5, i.e., the number of milliliters plated in each concentration of agar. The highest counts were obtained on the greatest number of samples with media containing 1.5 and 1.8 percent agar, respectively.

A graphic comparison of the bacterial counts per 1.0 cu. ft. of air obtained from the 48 air samples on media containing 1.8, 2.0, and 2.5 percent agar is shown in figure 2. The counts obtained with media containing 1.5 percent agar are omitted from the graph because this concentration of agar does not produce a medium of adequate stability for all air-sampling purposes. The bacterial counts obtained on the 1.8 percent agar are arranged in descending order of magnitude to provide a smooth curve and the counts obtained with the 2.0 and 2.5 percent agar for the corresponding samples are plotted on the same ordinates.

For purposes of further analysis only the data obtained with 1.8 and 2.5 percent agar are considered. It will be noted that there is considerable fluctuation of the corresponding counts obtained with the 2 concentrations on the various samples with a tendency for the 1.8 percent agar to give higher counts more frequently (34 times in 48 samples) which is more than might be expected from chance (24 ± 7).[5] It will be noted, however, that in a number of samples the counts are very close to each other and in each instance the 1.8 percent agar gave slightly higher counts, giving an advantage that seems unwarranted in view of wide fluctuations in the other counts.

[4] The enrichment broth is of the same composition as proteose extract agar with agar omitted.

[5] ($24 \pm 2\sqrt{48 \cdot \frac{1}{2} \cdot \frac{1}{2}}$ or 7.)

In terms of percentage, the 2.5 percent agar gave, on the average, counts that were 5.4 percent less than the counts on the 1.8 percent agar. The wide fluctuations of the counts around each other, however, give a large standard deviation around this mean percentage difference (5.4 percent ± 20.5), indicating that there is little assurance that one medium will give higher counts than the other for any single sample taken under the same conditions in which these samples were taken. The mean difference of 5.4 percent in the counts on the two media also is not significant (5.4 percent ± 3.0). Under the conditions of this experiment, it may be said that the 1.8 percent agar tends to give higher counts than the 2.5 percent agar, although the data were insufficient to prove this.

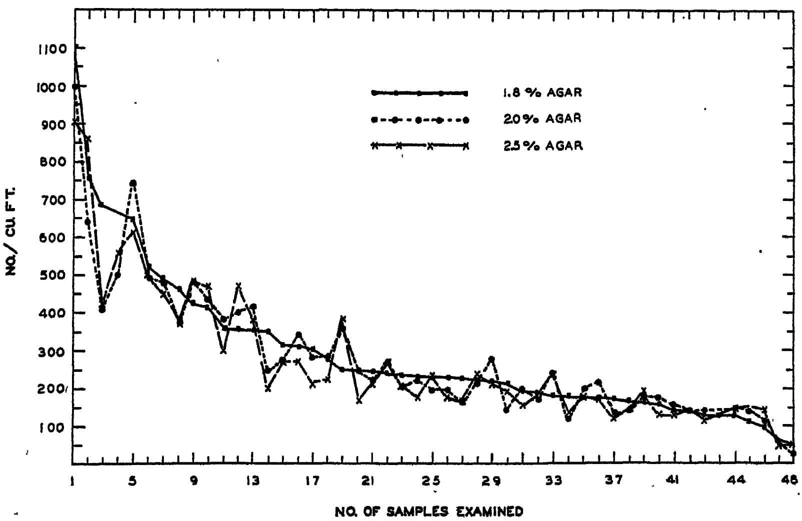


FIGURE 2.—Comparison of air-sample counts on proteose extract agar containing various percentages of agar.

It is concluded that a concentration of 1.8 percent agar is stable for use with all types of air-sampling devices. This concentration gives as high total counts as 1.5 percent agar and possibly higher counts than 2.5 percent agar. In view of the present shortage of agar, the use of a concentration above 1.8 percent would not be justified.

Comparison of proteose extract agar, tryptose agar, and meat infusion agar for general air sampling.—Proteose extract agar and the tryptose agar were selected for these studies because of their standard composition and their suitability for bacteria from the respiratory tract; and the meat infusion agar because it was believed that although of indefinite composition it more nearly approximated the "nutrient infusion agar" reported as used by so many previous investigators.

These media were prepared according to the formulae already given except that they were modified to contain 0.85 percent sodium chloride and 1.8 percent agar.

Sixty air samples were collected with the bubbler flask device in a room occupied by experimental animals, where bacterial air counts had been found to be extremely high during cleaning and feeding operations, and low during periods of quiet. Five or ten cubic feet of air were collected for each sample. Physiological saline (8.5 gm. NaCl per liter) was substituted for the enrichment broth in the sampling flasks for these studies. After the collection of samples each flask was immediately shaken to a consistent degree. One milliliter of sample fluid was inoculated into each of 15 plates and 5 of the inoculated plates were poured with each medium. All plates were incubated at 37° C. for 48 hours after the pouring and hardening of the medium. The number of bacteria per cubic foot of air was then determined, as previously described in this report.

The data, when treated statistically by converting the differences in the counts obtained on meat infusion and proteose extract agar to percentages of the corresponding meat infusion agar count, showed that although meat infusion gave higher counts more frequently (meat infusion 35 times, proteose extract 23 times, alike 2 times) the average percentage difference in counts was slightly in favor of the proteose extract agar (1.05 percent). Because of the wide fluctuations in the counts on the 2 media for the different samples, this is obviously not significant.

In a similar comparison of meat infusion agar with tryptose agar it was found that the counts on tryptose agar were, on the average, 8.2 percent lower than the counts on meat infusion agar. Here again, however, the individual counts on the two media showed wide variability (8.2 percent $\pm$39.9) and the mean percentage difference is not significant (8.2 percent $\pm$5.2).

A comparison of tryptose agar and proteose agar showed that the former gave, on the average, counts 4.6 percent lower than the latter. Here again wide fluctuation of individual counts gave a large standard deviation (4.6 percent $\pm$31 3) and the mean difference of 4.6 percent is not significant (4.6 percent $\pm$4.1).

From these calculations it cannot be concluded that any one of the three media has any advantage over the other two for general air sampling.

Another series of studies was undertaken in order to obtain data which were more adapted to statistical analysis. Nine air samples, of 5.0 cubic feet each, were collected with the bubbler flask device (fig. 1) in the same room as before. These 9 samples were thoroughly agitated and combined into 1 composite sample. One-milliliter quantities of fluid from the thoroughly shaken composite sample were inoculated into each of 30 petri dishes. Three sets of 10 of these plates were immediately poured with proteose extract agar, tryptose agar, and meat infusion agar, respectively, The elapsed time be-

tween inoculation and pouring of plates did not exceed 10 minutes. The composite sample was again agitated and the inoculation and plating processes repeated until 100 plates had been inoculated and poured with each type of medium. All plates were incubated at 37° C. for 48 hours after which the incidence of viable micro-organisms developing on each plate was determined.

In the comparison of counts from the composite air sample obtained on proteose extract agar, tryptose agar, and meat infusion agar only the first 30 counts were used since the counts tended to decrease gradually in subsequent platings. After discarding unsatisfactory counts there remained 23, 28, and 27 counts for the 3 media, in the order given above, which were satisfactory for statistical interpretation. The proteose extract agar gave a mean count of 8.9 ± 2.7; the tryptose agar a mean count of 12.4 ± 4.0; and the meat infusion agar a mean count of 14.3 ± 4.1. The difference in the mean counts between the proteose extract agar and tryptose agar are significant (3.5 ± 0.94) as is the difference between the proteose extract agar and the meat infusion agar (5.4 ± 0.97). However, the difference between the meat infusion agar and the tryptose agar (1.9 ± 1.08) is not significant.

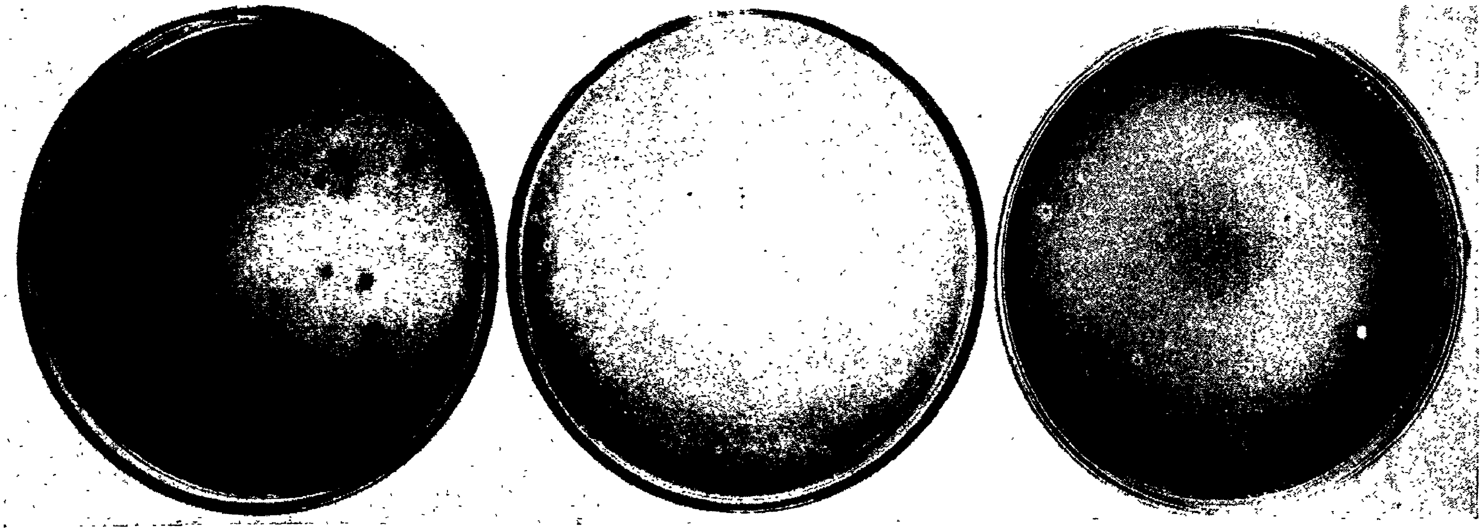
It will be noted that although the comparison of these three media on the basis of counts from replicate plates taken from a single composite air sample showed meat infusion agar and tryptose agar to give significantly higher mean counts than proteose extract agar, none of the three showed any statistically significant advantage in total bacterial counts on serial air samples. The reason for this is not clear but there are a number of possible explanations. First, in the serial air samples, collected over a period of months, only 5 plates were inoculated from each sample, whereas in the case of the large composite air sample, collected during one day, replicate plates (100) were inoculated. Hence, in the latter case the large number of plates used lessens the influence of marked fluctuations in counts which occur at times and allows slight actual differences in the efficiency of the different media to become apparent. Secondly, there is a fluctuation in the types of organisms obtained from serial air samples and these types may differ in their ability to grow on the various media.

Since in the serial air sample the proteose extract agar showed no tendency to give lower counts than the other two media, it is quite possible that if repeated composite air samples could be examined in replicate, first one and then another of the three media might show higher or lower counts, depending on the types of micro-organisms and their relative proportions of the total organisms in different samples.

Comparison of proteose extract agar, tryptose agar, and meat infusion agar for the recovery of Streptococcus salivarius *from artificially contaminated atmospheres.*—A specially constructed sheet-metal room

(7′ x 10′ x 8′) was employed for these studies. There were two doors to this room, one leading to the outside, the other to a similar room, which was used as an entry room. An inset 34″ x 33″ x 35″ at the bottom and to one side of the room provided outlets for the introduction of culture, and for the collection of air samples from the outside of the room. The room was sprayed with hot water and the floors, walls, and ceilings thoroughly washed the day before each experiment. Sterilization was accomplished by the burning of three 15 w., 18″ General Electric ultraviolet germicidal lights during the night before the experiment and not less than 4 hours before it began. Wet- and dry-bulb thermometers were suspended in front of a window in the wall of the room, thus permitting temperature readings for relative humidity determinations at the beginning of each sampling period. Fifty milliliters of a 24-hour tryptose broth culture were atomized into the test room for 1 hour. Air circulation was maintained throughout each experiment by means of an electric fan placed on the floor of the room. The culture mist was allowed to settle for 30 minutes, at the end of which time sampling was begun. Air samples were collected with the bubbler flask device (fig. 1) at 20-minute intervals throughout a 3.5-hour period. Each air sample of 5 cu. ft. was collected at a rate of 1 cu. ft. per minute. The rate of air flow was measured by means of a closed manometer placed between the sampling device and the air pump.

Each sample was thoroughly agitated as soon as collected and plated in quintuplicate (1.0 ml. of inoculum per plate) on each of three types of media. Six percent of sterile defibrinated sheep blood was added to each medium before the plates were poured. Following incubation of the inoculated plates at 37° C. for 48 hours, the incidence and size of the colonies of *Str. salivarius* developing on each type of medium were determined. For the entire series of tests proteose extract agar gave higher counts on 18.75 percent more samples than tryptose agar and 40.6 percent more samples than meat infusion agar. The mean of the counts for 32 samples was slightly higher for tryptose agar than for proteose extract agar. However, this was entirely due to 2 counts in the series which were extremely high on tryptose agar. The incidence and colonial appearance of *Str. salivarius* in plate cultures on each of the 3 media inoculated with aliquot portions of the same sample are shown in figure 3. While tryptose blood agar occasionally showed higher counts of this organism than proteose extract blood agar, the latter medium invariably developed larger and more distinctive colonies surrounded by a green or brown zone containing a precipitate which was characteristic of the organism. The colonies developing on tryptose blood agar were pin-point in size and would be very hard to distinguish in mixed culture.



Proteose extract agar — Tryptose agar — Meat infusion agar

Figure 3.—Incidence and colonial appearance of *Streptococcus salivarius* on proteose extract, tryptose, and meat infusion agar, inoculated with aliquot portions of the same sample.

A representative test from the series just described is given in table 2. Two important facts which are readily apparent from a study of this table and figure 3 are: (1) Proteose extract agar is markedly superior to either tryptose agar or meat infusion agar for the recovery of *Str. salivarius* from an artificially contaminated atmosphere, and (2) there is a rapid disappearance of the organism from the air following its introduction. Disappearance curves for *Str. salivarius*, based on the data submitted in table 2, are shown in figure 4. The number

TABLE 2. *Comparison of proteose extract agar, tryptose agar, and meat infusion agar for recovery of* Streptococcus salivarius *from artificially contaminated atmosphere*

Sample number	Time sampled (p. m.)	Relative humidity (percent)	Bubbler flask device Air-sample counts—number per cubic foot		
			Proteose extract agar	Tryptose agar	Meat infusion agar
17	1:35	66.0	251.0	195.0	63.7
18	1:50	66.0	97.0	90.0	12.0
19	2:10	66.0	22.0	15.0	2.0
20	2:30	66.0	4.0	4.0	0.0
21	2:50	66.0	1.0	0.0	1.0
22	3:10	66.0	1.0	0.0	0.0
23	3:30	66.0	2.0	0.0	0.0
24	3:50	66.0	0.0	0.0	0.0
Average (mean)			47.1	38.0	8.6

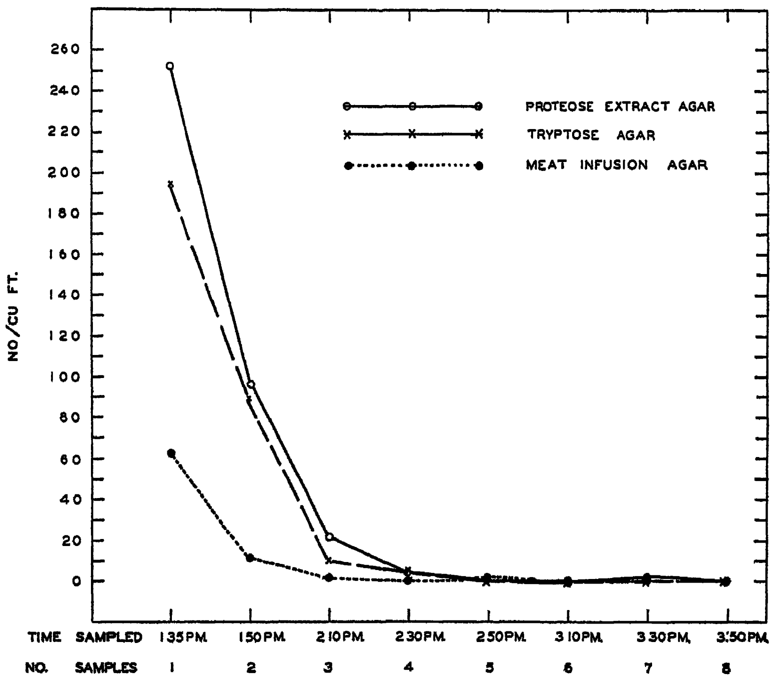


FIGURE 4.—Disappearance of *Streptococcus salivarius* from artificially contaminated atmosphere.

of viable bacteria recovered per cubic foot of air sampled is plotted on the ordinate and the time of sampling and the number of samples collected are given on the abscissa. It will be noted that the number of *Str. salivarius* recoverable from the air had been reduced almost to zero within 1.5 to 2.0 hours following atomization of the culture into the experimental chamber. The data presented in figure 4 are described as disappearance curves because adequate information is not yet available to indicate whether the disappearance of the organisms from the air is due to settling or to the death of the organisms. However, a limited number of laboratory multiple plating experiments indicate that the rapid disappearance of the organisms is due to their death. If subsequent studies substantiate this theory an explanation is provided for the low incidence of *Str. salivarius* recovered from the atmosphere in congested habitations such as sleeping quarters and schools. This would indicate that some other micro-organisms of respiratory habitat may provide a more satisfactory index of air contamination.

DISCUSSION

There can be little doubt of the heightened importance of air-borne infections at this time, in view of the aggregation of military populations and war workers in limited areas under conditions which favor the spread of such infections.

Despite numerous valuable contributions to this problem in recent years there is as yet neither a standard of air sanitation nor a routine analytical procedure such as has been established in the field of water sanitation.

Microbiological methods offer a quick easy means of determining bacterial air contamination and thus of evaluating the efficacy of physical and chemical methods for air disinfection. The usefulness of such microbiological methods would be greatly enhanced by the establishment of a standardized sampling procedure and of a standard of air sanitation, based on the incidence of types of micro-organisms indicative of contamination.

An approach has been made to the problem of establishing standard methods for the analysis of air by the development of a number of air-sampling devices. A comparison of the performance of these devices under a given set of conditions and recognition of factors affecting such performance has already been reported (*20, 21*). Comparatively little work has been done on the development of media for use with such devices although it would seem to be obvious that the culture medium is as important as the sampling device for detecting air-borne bacteria.

The proteose extract agar that is recommended for trial in air-sampling studies is believed to be superior to the other media that

have been used for this purpose. It appears to give a total count comparable to that obtained on ordinary meat infusion agar. In addition, both plating and air-sampling experiments show that it is superior for the growth of several strains of streptococci, organisms which have been suggested as indices of air pollution.

Proteose extract agar is also very favorable to the growth of other fastidious micro-organisms. A limited number of plating experiments showed that strains of *Neisseria intracellularis* and *Hemophilus influenzae* developed easily detectable colonies in proteose extract blood agar. Both these organisms have been carried in laboratory culture for over a year in proteose extract medium containing only 0.1 percent agar. In the course of other air-sampling studies on the atmospheres of human habitations, diphtheroids, unclassified Gram-negative and Gram-positive diplococci and the ever-present staphylococci were frequently recovered. It is therefore believed that this medium is favorable to fastidious micro-organisms of the upper respiratory tract.

Other factors which may necessitate still further modification of this medium are now under investigation. These include optimum pH, temperature of incubation and oxygen requirements of bacteria significant in air sampling, incorporation into the medium of chemical agents inhibitory to nonsignificant sporulating spreaders, and comparison with other media for ability to recover a diversity of types of micro-organisms from air.

The findings with regard to the inhibitory action of crystal violet on streptoccoci confirm those of Rose and Georgi (*36*). The incorporation of any inhibitory agent into an air-sampling medium should be attended by careful tests with low inocula of test organisms before it is recommended as routine procedure.

Str. salivarius, because of its relatively high incidence in the human respiratory tract, has been suggested as a satisfactory index of air contamination. However, our studies indicate that this organism tends to disappear very soon from an artificially contaminated atmosphere, apparently because of its rapid death rate. This fact may explain the failure of previous investigators to recover *Str. salivarius* in large numbers from the air of occupied areas. *Str. salivarius* is also difficult to distinguish from the ubiquitous staphylococcus species. If these disadvantages cannot be overcome, it is suggested that attention should be given to a study of other bacteria as suitable indexes of infectious air contamination.

SUMMARY

The requirements of a satisfactory standardized culture medium for air sampling are outlined as follows: (1) It should possess selectivity for fastidious micro-organisms from the respiratory tract; (2) it should

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inhibit nonsignificant saprophytes which interfere with accurate bacterial counts; and (3) it should have a standard composition, thus enabling other workers to use an identical culture medium under similar conditions.

Twelve different media were compared for growing streptococci, staphylococci, and a sporulating bacillus in an attempt to find one that would meet these requirements.

The addition of 1 : 500,000 crystal violet to each medium materially reduced the growth of all of the organisms tested, including the streptococci.

Proteose extract agar was found to be satisfactory for the growth of staphylococci and sporulates, and superior to all of the other media tested for the growth of streptococci.

A medium containing an agar concentration of 1.8 percent was found to possess adequate stability for use with impingement air-sampling devices without inhibiting bacterial growth.

Proteose extract agar, tryptose agar, and meat infusion agar were compared for general air-sampling purposes and for the recovery of *Str. salivarius* from the air. In general air sampling, higher counts were obtained on the greatest percentage of samples with meat infusion agar. However, there was no statistical significance between the counts obtained with the three media in serial air samples. Proteose extract agar was markedly superior to either of the other two media for the recovery of streptococci from air. This medium (proteose peptone, No. 3, Difco, 20.0 gm.; bacto-beef extract, 3.0 gm.; bacto-yeast extract, 3.0 gm.; bacto-malt extract, 3.0 gm.; bacto-dextrose, 5.0 gm.; sodium chloride, 8.5 gm.; bacto-agar, 18.0 gm.; distilled water, 1.0 liter; final pH, 6.8±) is suggested as a basic medium of standard composition, which may be employed for air-sampling purposes.

It was demonstrated that there is a rapid disappearance of *Str. salivarius* from an artificially contaminated atmosphere, and it is suggested that this rapid disappearance is primarily due to the death of the organism.

ACKNOWLEDGMENTS

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PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

May 20–June 16, 1945

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended June 16, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis rose from 136 during the preceding 4-week period to 302 for the 4 weeks ended June 16. Of the total cases, Texas reported 120, New York 28, California 25, South Carolina 17, Alabama 14, Virginia 11, and North Carolina, Georgia, and Utah 8 cases each. Since the beginning of the year there have been 198 cases reported in Texas, the largest number being from the following 6 counties in the extreme southeastern part of the State: Harris 46 (city of Houston 31), Hidalgo 17, Galveston and Hueces 12 each, and Bexar and Willacy

9 each; the remaining cases were widely scattered over the State. In 1944 and 1943 Texas reported 65 and 108 cases, respectively, for this same period. For the country as a whole for this same period there have been 999 cases reported, as compared with 657 for the corresponding period in 1944 and a median of 646 cases for the preceding 5 years (1940–44).

An increase of this disease is normally expected at this season of the year, and while the number of cases is relatively high, the rate of increase during the 4-week period was about normal. Five of the nine geographic sections reported increases over the normal seasonal incidence; in three sections the incidence was about normal, and in one section alone (West North Central) the number of cases was below the median.

Meningococcus meningitis.—For the current 4-week period there were 639 cases of this disease reported, as compared with 1,167 for the corresponding weeks in 1944 and a 5-year median of 288 cases. Each section of the country showed a decline from the 1944 figure for these same weeks, but in relation to the median seasonal expectancy the incidence was still high in each section. While the number of cases for this period is only about one-half of the number reported for the corresponding periods in 1944 and 1943, it will probably be some time before it reaches the low level of preceding years.

Diphtheria.—For the 4 weeks ended June 16 there were 810 cases of diphtheria reported, as compared with 676 for the corresponding period in 1944 and a preceding 5-year median of 703 cases. An increase in the number of cases over 1944 was reported from all sections except the Mountain and Pacific, the increases ranging from about 10 percent in the West South Central section to 85 percent in the West North Central section. Compared with recent years the number of cases for the country as a whole was about 15 percent above the 1940–44 median, and was higher than the median in each section of the country except the East North Central and Mountain sections.

Influenza.—The influenza incidence decreased about 35 percent during the 4 weeks ended June 16. The number of cases (3,479) was, however, about 20 percent above the incidence during the corresponding period in 1944. The 1940–44 median was represented by the 1944 figure (2,854 cases). An increase over the preceding 5-year median of approximately 40 percent was reported from the New England, West North Central, and West South Central, but in all other sections the incidence was relatively low.

Scarlet fever.—For this disease the incidence continued relatively high, 15,512 cases being reported for the current 4 weeks, as against 14,210 in 1944 and a preceding 5-year median of 10,121 cases. Only 4 of the geographic sections reported an increase over the 1944 figures for this period, but each of the 9 sections reported an increase over the 5-year median.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—The number of cases of measles was considerably below the normal incidence for this season. The reports showed a total of 19,349 cases for the 4 weeks ended June 16, as compared with 59,394 for the same 4 weeks in 1944 and a 1940–44 median of approximately 63,000 cases. The situation was favorable in each section of the country. For the country as a whole, as well as for each geographic section except the Pacific, the current incidence was the lowest for this period since 1938.

Smallpox.—The incidence of smallpox (25 cases) during the current 4 weeks stood at the level of the corresponding period in 1944, but it was only about 25 percent of the 1940–44 median. In the West North Central section the number of cases (14) was above the seasonal

Number of reported cases of 9 communicable diseases in the United States during the 4-week period May 20–June 16, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	810	676	703	3,479	2,854	2,854	19,349	59,394	62,904
New England	21	14	14	81	55	11	1,786	6,170	6,994
Middle Atlantic	103	90	94	21	15	27	3,155	8,342	10,115
East North Central	125	85	143	148	82	301	3,309	11,186	11,186
West North Central	83	45	46	48	14	35	873	3,114	4,496
South Atlantic	134	104	108	745	760	958	607	6,547	4,621
East South Central	45	33	42	112	198	167	354	919	1,265
West South Central	154	143	106	1,905	1,386	1,386	1,990	7,200	4,314
Mountain	50	54	54	346	229	329	982	1,839	2,789
Pacific	95	108	81	73	115	216	6,293	14,077	5,040
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	639	1,167	288	302	197	179	15,512	14,210	10,123
New England	36	70	29	5	5	5	1,720	1,415	974
Middle Atlantic	145	282	103	41	24	13	4,525	3,213	3,213
East North Central	142	286	21	16	13	9	4,234	4,376	3,041
West North Central	64	90	17	1	5	5	1,101	1,258	700
South Atlantic	88	120	56	50	43	15	1,294	1,065	529
East South Central	49	93	22	21	29	10	292	278	278
West South Central	56	87	20	128	43	16	353	362	172
Mountain	11	16	5	8	6	6	419	639	197
Pacific	48	123	25	32	29	29	1,574	1,604	589
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	25	25	105	323	411	457	10,203	7,443	15,016
New England	0	0	0	17	23	23	1,154	488	1,040
Middle Atlantic	0	0	0	35	36	62	1,959	978	2,585
East North Central	3	5	48	22	35	42	1,100	1,061	3,115
West North Central	14	4	9	8	23	29	255	418	655
South Atlantic	2	0	2	61	86	106	1,792	1,676	1,789
East South Central	0	7	8	67	53	47	458	518	632
West South Central	2	3	19	70	86	101	1,252	1,110	1,581
Mountain	3	5	5	19	23	15	359	717	717
Pacific	1	1	4	24	46	32	1,879	477	1,826

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

expectancy, while in other sections the incidence was the same or lower than the preceding 5-year median.

Typhoid and paratyphoid fever.—The incidence of this disease was also relatively low, the number of cases (323) reported being about 70 percent of the 5-year (1940–44) median. The East South Central and Mountain sections reported a few more cases than normally occur during this period, but in all other sections the incidence was below the seasonal median. For the country as a whole the number of cases was the lowest recorded for this period in the 17 years for which these data are available.

Whooping cough.—There were 10,203 cases of whooping cough reported for the 4 weeks ended June 16, as compared with 7,443 for the corresponding period in 1944. The 1940–44 median for this period was approximately 15,000 cases. The New England, Middle Atlantic, and Pacific sections reported significant increases over last year's figures for the corresponding weeks, but only one section, the New England, reported an increase over the 5-year median. In the South Atlantic and Pacific regions the incidence was about normal, while in other sections the numbers of cases fell below the normal expectancy.

MORTALITY, ALL CAUSES

For the 4 weeks ended June 16 there were 35,440 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding period in the years 1942–44 was 34,042 deaths. The number of deaths for each week of the current 4 weeks was higher than the 3-year average, the increases ranging from 1.1 percent in the second week to 8 percent in the last week of the period. The average increase for the 4 weeks was 4.4 percent.

INCIDENCE OF HOSPITALIZATION, MAY 1945

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	May	
	1944	1945
1. Number of plans supplying data	71	81
2. Number of persons eligible for hospital care	13,492,069	17,737,698
3. Number of persons admitted for hospital care	120,375	165,379
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	105.3	109.7
5. Incidence per 1,000 persons, annual rate, for the 12 months ended May 31	104.6	104.2
6. Number of plans reporting on hospital days	19	25
7. Days of hospital care per case discharged during month [1]	6.73	8.07

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

DEATHS DURING WEEK ENDED JUNE 16, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce

	Week ended June 16, 1945	Corresponding week, 1944
Data for 92 large cities of the United States:		
Total deaths	8,807	8,267
Average for 3 prior years	8,152	
Total deaths, first 24 weeks of year	224,692	229,646
Deaths under 1 year of age	568	635
Average for 3 prior years	596	
Deaths under 1 year of age, first 24 weeks of year	14,699	14,983
Data from industrial insurance companies:		
Policies in force	67,368,516	66,618,073
Number of death claims	14,203	12,459
Death claims per 1,000 policies in force, annual rate	11.0	9.8
Death claims per 1,000 policies, first 24 weeks of year, annual rate	10.9	10.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JUNE 23, 1945

Summary

A total of 116 cases of poliomyelitis was reported for the current week, as compared with 96 last week, 125 for the corresponding week last year, and a 5-year median of 69. The current week and the week ended May 12 are the only weeks this year in which a smaller number of cases was reported than for the corresponding week last year. Only 5 States, as follows (last week's figures in parentheses), reported more than 5 cases each: Texas 39 (37), New York 16 (10), Ohio 10 (1), California 9 (5), Alabama 8 (8). The total number of cases reported to date this year is 1,115, as compared with 782 and 894, respectively, for the corresponding periods of 1944 and 1943, and a 5-year median of 697. Since March 17, when the lowest weekly incidence to date this year (24 cases) was reported, 718 cases have been reported, 365 of which, or slightly more than 50 percent, were reported in 3 States, as follows (last year's corresponding figures in parentheses): Texas 221 (41), New York 94 (37), California 50 (71). Too much significance, however, should not be attached to the comparatively larger number of cases reported this year in some States. In New York for example, a large number of the cases reported during the current year are stated to have had onset in 1944 and were not reported at the time.

The incidence of meningococcus meningitis declined. A total of 122 cases was reported, as compared with 133 last week and a 5-year median of 112. The total to date is 5,275, as compared with 11,660 for the same period last year and a 5-year median of 1,967.

Six cases of psittacosis were reported during the week—1 in New York and 5 in Pennsylvania.

A total of 9,111 deaths was recorded during the week in 93 large cities of the United States, as compared with 8,849 for the preceding week, a 3-year (1942–44) average of 8,532, and 8,557 for the corresponding week last year. The cumulative figure is 234,564, as compared with 238,970 for the same period of 1944.

Telegraphic morbidity reports from State health officers for the week ended June 23, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944	
NEW ENGLAND												
Maine	2	0	0	------	------	------	1	69	111	0	0	0
New Hampshire	0	1	0	------	------	------	0	17	7	1	0	0
Vermont	0	0	0	------	------	------	59	19	47	0	0	0
Massachusetts	1	1	3	------	------	------	330	548	759	3	9	9
Rhode Island	0	0	0	------	------	------	18	5	97	1	1	1
Connecticut	2	1	1	1	------	1	59	138	200	2	1	1
MIDDLE ATLANTIC												
New York	11	14	13	[1] 4	([1])	[1] 2	170	638	996	14	27	17
New Jersey	2	2	4	4	1	2	64	432	933	3	11	3
Pennsylvania	9	8	8	------	1	------	769	244	463	10	15	6
EAST NORTH CENTRAL												
Ohio	1	2	5	2	1	3	45	93	182	3	15	4
Indiana	8	0	2	4	2	2	22	30	63	1	3	3
Illinois	1	7	17	4	------	6	335	134	217	17	17	1
Michigan [2]	17	9	4	------	1	1	261	345	508	6	10	0
Wisconsin	3	1	1	4	8	9	100	823	954	2	4	1
WEST NORTH CENTRAL												
Minnesota	2	9	1	------	------	------	6	117	117	0	2	1
Iowa	2	0	1	------	------	------	39	81	126	1	0	0
Missouri	4	2	1	8	------	------	14	39	65	5	14	1
North Dakota	1	1	1	10	------	2	3	13	13	0	0	0
South Dakota	0	3	0	------	------	------	5	5	5	0	0	0
Nebraska	0	2	1	------	------	------	48	39	39	0	0	0
Kansas	3	0	1	1	2	1	40	63	126	2	2	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	3	1	2	0	0	0
Maryland [2]	8	5	3	2	4	2	11	74	74	3	1	3
District of Columbia	0	0	0	------	------	------	4	46	46	0	3	2
Virginia	6	3	3	35	66	22	22	115	115	1	9	8
West Virginia	1	1	2	------	3	3	1	68	23	2	0	1
North Carolina	2	10	4	------	------	------	14	184	120	0	8	1
South Carolina	8	7	1	66	62	81	10	80	40	0	3	1
Georgia	4	2	2	1	3	12	6	29	42	0	2	2
Florida	0	2	2	1	6	6	3	64	50	0	4	1
EAST SOUTH CENTRAL												
Kentucky	1	2	3	1	1	1	17	16	42	3	3	1
Tennessee	2	2	3	8	8	9	28	21	50	2	3	0
Alabama	6	2	2	14	15	12	1	48	72	5	9	2
Mississippi [2]	8	1	1	------	------	------	------	------	------	1	4	1
WEST SOUTH CENTRAL												
Arkansas	4	3	3	1	8	8	33	63	23	3	1	1
Louisiana	3	2	3	1	1	2	60	42	13	[3] 0	7	1
Oklahoma	1	1	1	15	4	7	20	82	67	1	1	0
Texas	22	21	23	390	162	162	260	642	303	10	5	2
MOUNTAIN												
Montana	0	0	1	3	1	------	5	18	49	0	1	0
Idaho	1	0	0	------	------	------	3	5	9	1	2	1
Wyoming	0	0	0	------	------	2	12	25	18	0	2	0
Colorado	1	5	5	18	12	12	13	50	64	0	2	0
New Mexico	2	3	1	------	5	1	6	17	17	1	1	0
Arizona	1	0	2	38	26	26	3	35	35	0	0	0
Utah [2]	0	0	0	2	1	1	183	43	98	2	0	0
Nevada	0	4	0	2	------	------	0	9	1	0	0	0
PACIFIC												
Washington	8	6	2	4	1	1	180	123	130	3	4	1
Oregon	0	4	2	1	6	3	26	54	59	0	0	3
California	26	19	15	10	9	56	944	1,710	693	13	11	11
Total	184	168	168	655	420	451	4,256	7,556	8,695	122	217	112
25 weeks	6,533	5,419	6,178	65,802	334,931	166,266	87,795	570,515	499,064	[3] 5,275	11,660	1,967

[1] New York City only. [2] Period ended earlier than Saturday.
[3] Correction: Louisiana, week ended June 2, meningococcus meningitis 7 cases (instead of 5).

Telegraphic morbidity reports from State health officers for the week ended June 23, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944		June 23, 1945	June 24, 1944	
NEW ENGLAND												
Maine	0	0	0	27	16	8	0	0	0	0	1	0
New Hampshire	0	0	0	10	1	1	0	0	0	0	0	0
Vermont	0	0	0	4	6	3	0	0	0	0	0	0
Massachusetts	0	0	0	179	164	139	0	0	0	0	3	3
Rhode Island	0	0	0	5	7	5	0	0	0	0	0	0
Connecticut	3	1	1	16	25	29	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	16	9	3	427	219	219	0	0	0	6	2	7
New Jersey	2	1	1	77	71	71	0	0	0	3	1	1
Pennsylvania	1	2	1	294	141	141	0	0	0	2	2	4
EAST NORTH CENTRAL												
Ohio	10	7	1	197	97	101	0	0	0	1	3	5
Indiana	0	1	0	31	20	20	1	0	0	1	0	2
Illinois	2	5	3	129	75	87	0	0	0	2	4	4
Michigan [2]	1	2	2	167	158	148	0	0	0	5	1	3
Wisconsin	0	0	0	86	104	67	0	3	1	0	1	1
WEST NORTH CENTRAL												
Minnesota	0	4	1	64	52	23	0	0	0	0	0	0
Iowa	1	0	0	20	27	15	2	0	1	0	0	0
Missouri	1	0	1	23	22	14	0	0	0	2	2	1
North Dakota	0	0	0	3	10	6	0	0	0	4	0	0
South Dakota	0	0	0	1	6	6	0	0	0	0	0	0
Nebraska	0	0	0	19	13	9	0	0	0	0	0	0
Kansas	2	1	0	43	9	16	0	0	0	0	8	1
SOUTH ATLANTIC												
Delaware	0	0	0	1	2	4	0	0	0	0	0	1
Maryland [2]	1	0	0	47	58	27	0	0	0	0	2	2
District of Columbia	0	0	0	18	17	6	0	0	0	1	0	0
Virginia	0	4	1	27	23	7	0	0	0	4	2	3
West Virginia	0	0	0	22	26	15	0	0	0	2	2	3
North Carolina	0	41	1	27	11	11	0	0	0	1	6	5
South Carolina	5	2	1	2	12	2	0	0	0	2	4	4
Georgia	5	1	1	11	7	7	0	0	0	11	5	13
Florida	2	1	1	2	6	1	0	0	0	0	2	2
EAST SOUTH CENTRAL												
Kentucky	0	17	1	22	15	17	0	0	3	5	3	3
Tennessee	2	0	0	9	19	15	0	0	0	3	2	5
Alabama	8	3	2	6	3	3	0	0	0	5	2	2
Mississippi [2]	1	2	2	12	5	3	0	0	0	3	6	4
WEST SOUTH CENTRAL												
Arkansas	0	2	2	7	0	2	0	0	0	7	2	6
Louisiana	0	7	2	12	4	4	0	0	0	4	6	9
Oklahoma	3	2	1	9	3	3	1	0	0	2	3	4
Texas	39	4	3	39	23	23	1	1	0	15	16	18
MOUNTAIN												
Montana	0	0	0	6	13	9	0	0	0	1	1	1
Idaho	0	0	0	4	6	6	0	0	0	1	0	1
Wyoming	0	0	0	6	4	4	0	0	0	0	0	0
Colorado	2	2	0	21	31	17	0	0	0	0	2	2
New Mexico	0	0	0	7	7	4	0	0	0	2	1	1
Arizona	0	0	1	12	12	3	0	0	0	0	4	3
Utah [2]	0	1	0	10	16	7	0	0	0	1	0	0
Nevada	0	0	0	3	0	0	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	39	71	23	0	0	0	2	0	2
Oregon	0	0	0	11	35	7	0	0	1	1	1	1
California	9	3	7	234	164	112	0	0	1	1	8	6
Total	116	125	69	2,448	1,836	1,836	5	4	12	100	104	150
25 weeks	1,115	782	697	126,110	139,920	91,042	240	263	568	1,607	2,004	2,212

[2] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately, as follows: New York 4; Michigan 1; Virginia 1; South Carolina 1; Texas 1.

Telegraphic morbidity reports from State health officers for the week ended June 23, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— June 23, 1945	Whooping cough: Week ended— June 24, 1944	Whooping cough: Median 1940–44	Week ended June 23, 1945: Dysentery, Amebic	Dysentery, Bacillary	Dysentery, Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever	Undulant fever
NEW ENGLAND											
Maine	46	14	14	0	0	0	0	0	0	0	1
New Hampshire	0	0	2	0	0	0	0	0	0	0	0
Vermont	16	18	18	0	0	0	0	0	0	0	1
Massachusetts	75	58	116	1	0	0	0	0	0	0	0
Rhode Island	19	3	16	0	1	0	0	0	0	0	0
Connecticut	39	24	49	1	0	0	0	0	0	0	0
MIDDLE ATLANTIC											
New York	177	110	283	4	5	0	1	0	0	0	4
New Jersey	157	46	94	0	0	0	0	1	0	0	4
Pennsylvania	197	80	250	0	0	0	0	1	0	0	4
EAST NORTH CENTRAL											
Ohio	107	83	173	2	0	0	1	0	0	0	3
Indiana	10	12	24	0	0	0	0	1	1	0	0
Illinois	60	71	102	0	2	0	2	0	0	0	12
Michigan [1]	56	64	173	3	0	0	0	0	0	0	6
Wisconsin	30	62	123	0	0	0	0	0	1	0	16
WEST NORTH CENTRAL											
Minnesota	12	25	39	2	0	0	0	0	0	0	5
Iowa	1	8	28	0	0	0	0	0	0	0	8
Missouri	15	20	20	0	0	0	0	0	2	0	0
North Dakota	2	13	13	0	0	0	0	0	0	0	0
South Dakota	0	19	2	0	0	0	0	0	0	0	6
Nebraska	3	34	11	0	0	0	0	0	0	0	0
Kansas	44	29	56	0	0	0	1	0	0	0	9
SOUTH ATLANTIC											
Delaware	1	0	2	0	0	0	0	1	0	0	0
Maryland [1]	82	90	75	0	0	0	0	5	0	0	1
District of Columbia	8	1	10	0	0	0	0	0	0	0	0
Virginia	46	111	103	0	0	250	0	1	2	0	1
West Virginia	11	7	33	0	0	0	0	0	0	0	0
North Carolina	221	184	155	0	0	0	0	1	0	4	0
South Carolina	53	41	41	2	50	0	0	0	0	3	0
Georgia	31	13	23	1	1	0	0	1	0	15	3
Florida	15	10	10	0	0	0	0	0	0	10	0
EAST SOUTH CENTRAL											
Kentucky	45	103	75	0	0	0	0	1	0	0	0
Tennessee	24	34	34	0	0	0	0	1	0	1	1
Alabama	23	48	40	0	0	0	0	0	0	16	4
Mississippi [1]	------	------	------	0	0	0	0	0	1	3	0
WEST SOUTH CENTRAL											
Arkansas	3	16	31	0	1	0	0	0	3	0	1
Louisiana	6	1	14	[5] 2	1	0	0	0	0	16	4
Oklahoma	22	1	16	0	1	0	0	0	2	0	1
Texas	243	215	359	15	415	50	2	0	0	38	11
MOUNTAIN											
Montana	7	9	15	0	0	0	0	0	0	0	0
Idaho	0	9	9	0	0	0	0	0	0	0	0
Wyoming	2	15	5	0	0	0	0	0	0	0	0
Colorado	35	21	30	0	2	0	0	0	0	0	9
New Mexico	16	4	16	0	2	0	0	0	0	0	0
Arizona	23	13	13	0	0	36	0	0	0	0	2
Utah [1]	37	76	76	0	0	0	1	0	2	0	3
Nevada	0	0	0	0	0	1	0	0	0	0	0
PACIFIC											
Washington	10	10	53	0	0	0	0	0	0	0	0
Oregon	13	9	30	3	0	0	0	0	0	0	5
California	321	82	282	4	7	0	0	0	0	1	7
Total	2,364	1,916	3,475	40	488	337	8	14	14	107	132
Same week, 1944	1,916	------	------	54	548	304	9	36	12	94	73
Average, 1942–44	3,253	------	------	62	451	240	10	[6] 31	22	[6] 58	------
25 weeks, 1945	62,419	------	------	[5] 793	10,981	3,097	174	127	390	1,471	2,369
1944	45,334	------	------	676	8,033	2,426	274	146	280	1,292	1,557
Average, 1942–44	80,860	------	[6] 95,277	694	5,533	1,847	255	[6] 163	410	[6] 954	------

[1] Period ended earlier than Saturday.
[5] Correction: Louisiana, week ended June 2, amebic dysentery 12 cases (instead of 2).
[6] 5-year median, 1940–44.

Leprosy: Texas 3; Washington 1. *Psittacosis:* New York 1; Pennsylvania 5.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 16, 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	0	1	0	0	4
New Hampshire:												
Concord	0	0	------	0	3	0	0	0	3	0	0	0
Vermont:												
Barre	0	0	------	0	25	0	0	0	1	0	0	0
Massachusetts:												
Boston	1	0	------	0	118	3	11	0	75	0	1	31
Fall River	0	0	------	0	0	0	1	0	3	0	0	1
Springfield	0	1	------	0	1	0	1	0	19	0	0	2
Worcester	0	0	------	0	47	0	6	0	5	0	0	0
Rhode Island:												
Providence	0	0	------	0	2	0	1	0	10	0	0	14
Connecticut:												
Bridgeport	0	0	------	0	0	0	1	1	0	0	0	0
Hartford	0	0	------	0	17	0	0	0	6	0	0	0
New Haven	0	0	1	0	0	0	0	0	2	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	1	2	3	3	14	0	0	0
New York	15	1	1	0	86	9	48	3	221	0	1	83
Rochester	0	0	------	0	53	0	1	0	17	0	0	5
Syracuse	0	0	------	0	0	0	2	0	1	0	0	29
New Jersey:												
Camden	0	0	------	0	5	0	1	0	1	0	0	0
Newark	0	0	1	0	6	0	2	0	8	0	0	11
Trenton	0	0	------	0	5	0	2	0	1	0	0	2
Pennsylvania:												
Philadelphia	3	0	1	1	407	1	15	2	53	0	1	87
Pittsburgh	1	0	2	2	7	1	3	1	58	0	0	20
Reading	0	0	------	0	1	0	0	0	11	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	4	1	5	2	12	0	0	7
Cleveland	1	0	------	0	16	1	3	1	33	0	0	33
Columbus	0	0	------	0	0	0	1	0	7	0	0	3
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	1	2	0	0
Indianapolis	5	0	------	1	3	1	7	0	6	0	0	3
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	1	0	2	0	0	0
Illinois:												
Chicago	3	0	------	1	190	6	18	0	88	0	0	20
Springfield	0	0	------	1	0	0	1	0	0	0	0	0
Michigan:												
Detroit	12	0	------	0	152	1	15	0	63	0	1	26
Flint	0	0	------	0	5	0	5	0	8	0	0	1
Grand Rapids	0	0	------	0	5	0	2	0	4	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	15	0	0	0	0	0	0	2
Milwaukee	1	0	------	0	14	1	1	0	63	0	0	2
Racine	0	0	------	0	1	0	0	0	4	0	0	6
Superior	0	0	------	0	7	0	0	0	2	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	2	0	6	0	0	0
Minneapolis	1	0	------	1	5	1	5	0	15	0	0	8
St. Paul	0	0	------	0	3	0	2	0	0	0	0	6
Missouri:												
Kansas City	1	0	------	1	15	1	8	0	9	0	0	4
St. Joseph	0	0	------	0	0	0	0	0	0	0	1	8
St. Louis	0	0	1	0	7	3	10	0	12	0	0	7

City reports for week ended June 16, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	1	------	0	1	0	0	0	0	0	0	0
Nebraska:												
Omaha	2	0	------	0	2	0	1	0	10	0	0	0
Kansas:												
Topeka	1	0	------	0	0	0	0	0	5	0	0	0
Wichita	1	0	------	0	0	0	2	0	7	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	1	0	0	0	0	0
Maryland:												
Baltimore	9	0	1	2	9	2	5	0	39	0	0	59
Cumberland	0	0	------	0	0	0	0	0	1	0	0	1
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	2	1	5	0	25	0	0	11
Virginia:												
Lynchburg	0	0	------	0	2	0	0	0	3	0	0	0
Richmond	0	0	------	0	2	2	0	0	6	0	0	0
Roanoke	0	0	------	0	0	0	0	0	0	0	1	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	0	0	0	4
Wheeling	1	0	------	0	3	2	0	0	0	0	1	0
North Carolina:												
Raleigh	0	0	------	0	2	0	3	0	1	0	0	5
Wilmington	0	0	------	0	6	0	2	0	1	0	0	12
Winston-Salem	0	0	------	0	1	0	1	0	5	0	0	11
South Carolina:												
Charleston	0	0	------	0	0	0	1	0	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	2	1	0	0	0	4
Brunswick	0	0	------	0	0	0	1	0	0	0	0	1
Savannah	1	0	------	0	0	0	0	0	2	0	0	1
Florida:												
Tampa	0	0	------	0	1	1	1	0	2	0	1	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	2	0	17	3	4	1	1	0	0	4
Nashville	0	1	------	1	0	0	1	0	2	0	0	0
Alabama:												
Birmingham	0	0	1	0	1	0	1	5	2	0	0	0
Mobile	0	0	------	0	0	0	0	1	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	3	0	1	0	2	0	0	0
Louisiana:												
New Orleans	1	0	1	0	7	1	6	0	9	0	2	4
Texas:												
Dallas	3	0	------	0	4	0	0	0	1	0	0	1
Galveston	0	0	------	0	0	0	0	1	0	0	0	0
Houston	1	0	------	1	4	1	3	7	2	0	0	0
San Antonio	1	0	1	0	0	0	8	2	1	0	0	4
MOUNTAIN												
Montana:												
Billings	0	0	------	0	1	0	0	0	1	0	0	0
Great Falls	0	0	------	0	0	0	0	0	1	0	0	0
Helena	0	0	------	0	2	0	0	0	2	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	1	0	0	0	6	0	6	0	0	2
Pueblo	0	0	------	0	0	0	0	0	0	0	0	3
Utah:												
Salt Lake City	0	0	------	0	49	1	0	0	1	0	0	4
PACIFIC												
Washington:												
Seattle	1	0	------	0	26	0	1	0	14	0	1	[illegible]
Spokane	1	0	1	0	1	0	4	0	3	0	0	0
Takoma	0	0	------	0	41	0	0	0	1	0	0	[illegible]

City reports for week ended June 16, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC—continued												
California:												
Los Angeles	2	0	3	0	72	2	2	0	48	0	0	60
Sacramento	1	0	------	0	18	0	0	0	4	0	0	2
San Francisco	5	0	------	0	161	0	7	1	46	0	0	19
Total	76	4	18	12	1.665	48	255	32	1,100	2	11	641
Corresponding week, 1944	49	------	22	4	2,424	------	221	------	854	0	13	382
Average, 1940-44	56	------	33	[1] 11	[2] 3,776	------	[1] 269	------	817	0	21	1.039

[1] 3-year average, 1942-44. [2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York, 3; Philadelphia, 1; Detroit, 2; Houston, 1.
Dysentery, bacillary.—Cases: New York, 15; Rochester, 1; Chicago, 1, Charleston, S. C., 6; Los Angeles, 2; San Francisco, 1.
Dysentery, unspecified.—Cases: San Antonio, 14.
Leprosy.—Cases: Los Angeles, 1.
Rocky Mountain spotted fever.—Cases: Baltimore, 1; Atlanta, 2.
Typhus fever, endemic.—Cases: Atlanta, 1; Birmingham, 1; New Orleans, 1; Galveston, 2; Houston, 2; San Antonio 2

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,303,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	2.6	2.6	2.6	0.0	557	7.8	57.5	2.6	327	0.0	2.6	144
Middle Atlantic	8.8	0.5	2.3	1.4	264	6.0	35.6	4.2	178	0.0	0.9	111
East North Central	13.4	0.0	0.0	1.8	251	6.7	36.5	1.8	179	1.2	0.6	64
West North Central	11.9	2.0	2.0	4.0	66	9.9	59.7	0.0	127	0.0	2.0	46
South Atlantic	18.0	0.0	1.6	3.3	47	13.1	36.0	1.6	139	0.0	4.9	178
East South Central	0.0	6.0	17.7	6.0	106	17.7	35.4	41.3	30	0.0	0.0	24
West South Central	21.1	0.0	6.0	3.0	54	6.0	54.4	30.2	45	0.0	6.0	27
Mountain	0.0	0.0	7.9	0.0	413	7.9	47.7	0.0	87	0.0	0.0	79
Pacific	15.8	0.0	6.3	0.0	504	3.2	22.1	1.6	183	0.0	1.6	134
Total	11.6	0.6	2.7	1.8	254	7.3	38.9	4.9	168	0.3	1.7	98

PLAGUE INFECTION IN BANNOCK COUNTY, IDAHO

Plague infection has been reported proved in a pool of 265 fleas, 7 ticks, and 8 lice from 3 marmots taken on June 1, 1945, from a location 1 mile east of State Highway No. 34 at a point 4 miles south of Grace, Bannock County, Idaho, and in a pool of 16 fleas from 28 mice, *Peromyscus* sp., taken June 2 from the same location.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Influenza.—According to information dated June 26, 1945, 1,513 cases of influenza had occurred on the island of Oahu, T. H., during the preceding 3 weeks. The virus was stated to be Type B according to Army laboratory tests and the disease was said to be of mild type, with few complications. For the month of June 1944, 44 cases of influenza were reported for all of Hawaii Territory with no cases being reported on the island of Oahu.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 2, 1945.—During the week ended June 2, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		10	1	264	393	47	20	67	130	932
Diphtheria		6	1	32	2	2				43
Dysentery, bacillary				5					3	8
German measles		5		5	111	3	1	29	32	186
Influenza		13			83	1			8	105
Measles		8		153	219	32	43	150	267	872
Meningitis, meningococcus				2		1	1		2	6
Mumps		7		144	131	61	37	126	14	520
Poliomyelitis				1		1				2
Scarlet fever		6	11	88	76	8	9	11	9	218
Tuberculosis (all forms)		2	8	51	34	29		52	41	217
Typhoid and paratyphoid fever		1		4				2		7
Undulant fever				8	4					12
Venereal diseases:										
Gonorrhea		19	32	75	111	35	21	37	79	409
Syphilis	3	36	10	108	83	7	5	12	81	295
Whooping cough		3	1	109	30	8	1	23	3	178

CUBA

Provinces—Notifiable diseases—4 weeks ended May 19, 1945.—During the 4 weeks ended May 19, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	2	2	3		5	13
Chickenpox		23		4	1	26	54
Diphtheria		14	2			1	17
Malaria				2	1	11	14
Measles		4			1	2	7
Poliomyelitis				1			1
Rabies						1	1
Tuberculosis	16	30	21	20	4	25	116
Typhoid fever	10	110	21	43	22	39	245
Undulant fever	1	1					2

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—April 1945.—During the month of April 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	23	Mumps	697
Chickenpox	395	Paratyphoid fever	244
Conjunctivitis	19	Pneumonia	2,680
Diphtheria	1,268	Poliomyelitis	9
Dysentery, unspecified	11	Puerperal fever	29
Gastroenteritis	2,209	Rheumatic fever	262
Gonorrhea	1,859	Scabies	3,583
Hepatitis, epidemic	611	Scarlet fever	394
Influenza	1,187	Syphilis	399
Laryngitis	40	Typhoid fever	37
Malaria	18	Vincent's angina	21
Measles	210	Whooping cough	2,998

NEW ZEALAND

Notifiable diseases—4 weeks ended May 19, 1945.—During the 4 weeks ended May 19, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	5	3	Poliomyelitis	2	1
Diphtheria	148	6	Puerperal fever	5	2
Dysentery, bacillary	26		Scarlet fever	612	1
Erysipelas	19		Tetanus	2	1
Food poisoning	12		Trachoma	1	
Influenza	1	2	Tuberculosis (all forms)	133	42
Malaria	13		Typhoid fever	5	2
Ophthalmia neonatorum	1				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

China—Chungking.—A report dated June 21, 1945, stated that cholera was spreading in Chungking, where more than 2,000 cases had occurred, and during the preceding 10 days more than 200 persons had died of the disease. A telegraphic report dated June 15, 1945, stated that 1 case of cholera had been reported in Pei Shi Yu, and 1 case in Shin Chiao, Szechwan Province. A report dated June 18, 1945, stated that 1 case with 1 death had occurred in Hsin Kai Shik, Pa Hsien, Szechwan Province, and 1 case in Hsiao Lung Ken, Chungking. Contributing factors were said to be inadequate supply of drinking water and influx of refugees who are living in Chungking under insanitary conditions. Precautionary measures are being taken.

Plague

Canada—Alberta Province.—On June 9, 1945, plague-infection was reported in fleas taken from ground squirrels found on the east side of Lake Newell, Province of Alberta, Canada.

China—Foochow.—According to a report dated June 11, 1945, more than 30 cases of bubonic plague have occurred in Foochow, China, since May 25, 1945. Measures are now being taken to combat the disease.

Madagascar.—For the period May 1–10, 1945, 4 cases of plague were reported in Madagascar.

Morocco (French).—For the period June 1–10, 1945, 81 cases of plague were reported in French Morocco.

Smallpox

British East Africa—Tanganyika.—Smallpox has been reported in Tanganyika as follows: Weeks ended—May 12, 1945, 1 case in Dar-Es-Salaam; May 19, 1945, 78 cases with 2 deaths in the whole territory.

Nigeria.—Smallpox has been reported in Nigeria as follows: Weeks ended—April 14, 1945, 185 cases, 27 deaths, April 21, 1945, 198 cases, 50 deaths, including 1 case in Port Harcourt.

Sierra Leone.—Smallpox has been reported in Sierra Leone, as follows: Weeks ended—April 14, 1945, 2 cases, 1 death, in Freetown, May 5, 1945, 10 cases.

Typhus Fever

British East Africa—Kenya—Mombasa.—For the week ended May 26, 1945, 8 cases of typhus fever were reported in Mombasa, Kenya, British East Africa.

Chile.—For the 4 weeks ended April 21, 1945, 63 cases of typhus fever with 3 deaths were reported in Chile. Provinces reporting the highest incidence are as follows: Concepcion, 13 cases; Chiloe, 10 cases, 2 deaths; Tarapaca, 8 cases; Valparaiso, 8 cases.

France—Lyon.—For the month of May 1945, 5 cases of typhus fever were reported in Lyon, France, among deportees recently repatriated from German concentration camps.

Iran.—For the period January 28 to February 17, 1945, 150 cases of typhus fever were reported in Iran, including 14 cases reported in Tehran.

Morocco (French).—For the period June 1–10, 1945, 308 cases of typhus fever were reported in French Morocco, including 28 cases reported in Casablanca and 8 cases in Rabat.

Peru.—For the month of April 1945, 56 cases of typhus fever were reported in Peru, including 36 cases in Cuzco Department and 10 cases in Ancash Department.

Sierra Leone—Freetown.—During the week ended April 21, 1945, 1 case of typhus fever was reported in Freetown, Sierra Leone.

Turkey.—For the week ended June 16, 1945, 45 cases of typhus fever were reported in Turkey, including 1 case in Antalya, 2 cases in Istanbul, and 2 cases in Zonguldak.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Public Health Methods, pursuant to the following authority of law: United States Code, title 42. sections 241, 245, 247; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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INFLUENZA AND PNEUMONIA EXCESS MORTALITY AT SPECIFIC AGES IN THE EPIDEMIC OF 1943–44, WITH COMPARATIVE DATA FOR PRECEDING EPIDEMICS [1]

By SELWYN D. COLLINS, *Head Statistician, United States Public Health Service*

Twenty-four pandemics of influenza involving two or more continents have occurred in the 450 years since the discovery of America (*15*). North America was involved in 14 of these great epidemics but the other 10 were apparently confined to Europe and Asia. In many instances few details are known about these pandemics and only in recent years have specific studies been made of the smaller outbreaks which precede and follow the major peaks.

HISTORICAL REVIEW OF EPIDEMICS IN THE UNITED STATES

The epidemic of December–January 1943–44 was the sixteenth in the United States since the pandemic of 1918–19 (figs. 1 and 2). Although some of these outbreaks were very small, they all show considerable excess over the normal seasonal expectancy of influenza and pneumonia mortality in at least 3 of the 9 geographic sections of the country and were accompanied by large numbers of influenza cases reported to health departments or as recorded in family surveys (*2, 3*) and among industrial employees. Since the beginning of 1920 these epidemics have caused an estimated total of nearly 400,000 deaths from influenza and penumonia in this country in excess of the normal expectancy, as compared with 550,000 excess deaths from those causes in 1918–19 (table 1).

From about 1910 to 1918 there was not much change in the level of mortality from influenza and penumonia during nonepidemic periods. After the pandemic of 1918–19 the general level of mortality in non-

[1] Received for publication February 1, 1945. From the Division of Public Health Methods. This is the first of two sections of a paper on influenza and pneumonia excess mortality. The second section will appear in an early issue of the PUBLIC HEALTH REPORTS. Data on age variation in mortality in the 10-percent sample of the United States for the 1943–44 epidemic were furnished to the Public Health Service by the Bureau of the Census prior to publication (*20*). For assistance in the preparation of this paper the author is indebted to Dr. Mary Gover and Mrs. Maryland Y. Pennell.

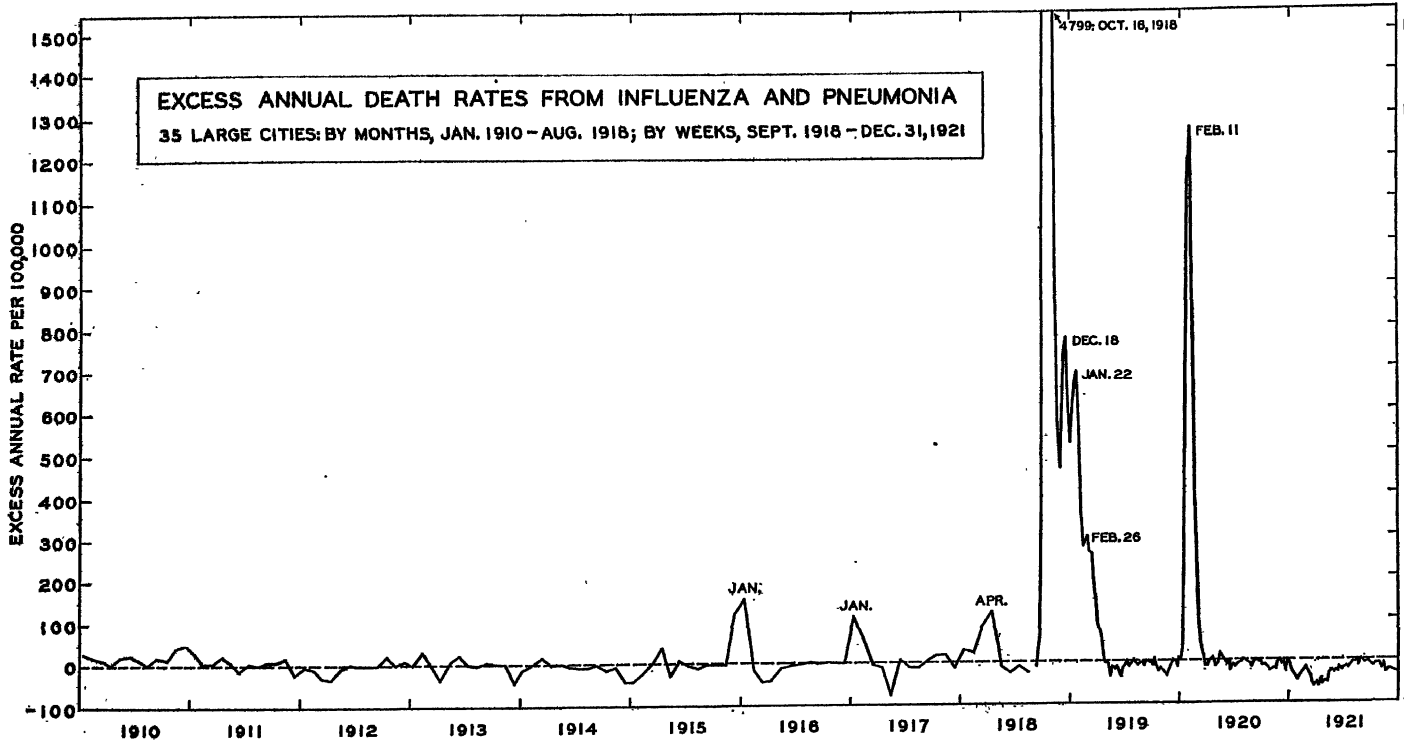

FIGURE 1.—Excess mortality from influenza and pneumonia in 35 large cities in the United States, 1910–21. (Dates on chart are middle, Wednesday, of peak weeks. Prior to July 1 1919, excess rates are deviations from smoothed median rate for corresponding month or week for period 1910–16; after that date they are deviations from smoothed median rate for corresponding week for period 1921–27. See referecne 7 for tables of rates and table 1 for total excess for each epidemic.)

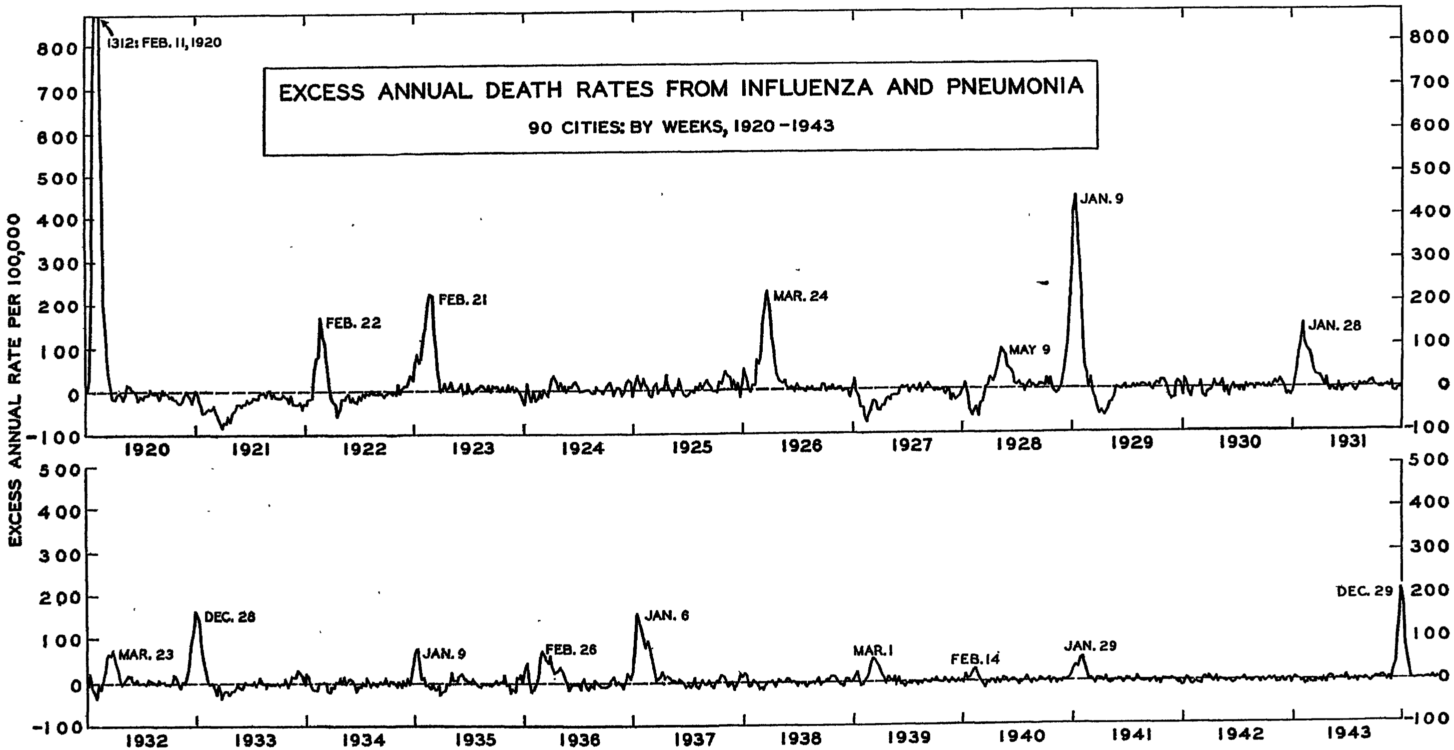

FIGURE 2.—Excess mortality from influenza and pneumonia in about 90 representative cities in the United States, 1920-44. (Dates on chart are middle, Wednesday, of peak weeks. In 1920-29 excess rates are deviations from smoothed median rate for corresponding week for period 1921-27; in 1930 and later years they are deviations from average rate for corresponding week for "normal" years with adjustment for downward trend in rates in nonepidemic periods. See references 6, 8, and 11 for tables of rates.)

TABLE 1.—*Summary of excess*[1] *mortality from influenza and pneumonia per 100,000 population during whole epidemics in groups of cities in the United States, 1910–44, and in Massachusetts, 1887–1915*

Area and epidemic	Excess rate per 100,000 during whole epidemic	Wednesday of peak week (or peak month)	Total period considered as above normal	
			Total time	Months or weeks included
90 representative cities:			*Weeks*	
1943–44	15.6	Dec. 29, 1943	11	Nov. 21, 1943–Feb. 5, 1944.
1940–41	5.4	Jan. 29, 1941	10	Dec. 15, 1940–Feb. 22, 1941.
Early 1940	1.9	Feb. 14, 1940	6	Jan. 21–Mar. 2, 1940.
Spring 1939	5.2	Mar. 1, 1939	9	Feb. 5–Apr. 8, 1939.
1936–37	18.4	Jan. 6, 1937	11	Dec. 20, 1936–Mar. 6, 1937.
Early 1936	12.5	Feb. 26, 1936	22	Dec. 22, 1935–May 23, 1936.
1934–35	5.4	Jan. 9, 1935	9	Dec. 2, 1934–Feb. 2, 1935.
1932–33	19.2	Dec. 28, 1932	11	Nov. 20, 1932–Feb. 4, 1933.
Spring 1932	7.4	Mar. 23, 1932	9	Feb. 14–Apr. 16, 1932.
Early 1931	16.4	Jan. 28, 1931	16	Dec. 28, 1930–Apr. 18, 1931.
1928–29	44.4	Jan. 9, 1929	12	Nov. 25, 1928–Feb. 16, 1929.
Spring 1928	11.6	May 9, 1928	19	Mar. 11–July 21, 1928.
Spring 1926	25.3	Mar. 24, 1926	17	Jan. 27–May 25, 1926.
1922–23	29.9	Feb. 21, 1923	17	Nov. 26, 1922–Mar. 24, 1923.
Early 1922	18.3	Feb. 22, 1922	12	Jan. 8–Apr. 1, 1922.
Early 1920	99.3	Feb. 11, 1920	12	Jan. 4–Mar. 27, 1920.
35 large cities:				
1918–19	550.5	Oct. 16, 1918	31	Sept. 15, 1918–Apr. 19, 1919.
			Months	
Spring 1918	21.1	April 1918	4	January–April 1918.
Early 1917	14.0	January 1917	2	January–February 1917.
1915–16	22.8	January 1916	2	December 1915–January 1916.
Massachusetts:				
Spring 1915	12.6	April 1915	2	March–April 1915.
1907–08	19.7	December 1907	3	December 1907–February 1908.
Early 1905	13.8	February 1905	3	January–March 1905.
Early 1901	17.1	February 1901	3	January–March 1901.
Spring 1900	47.8	March 1900	3	March–May 1900.
1898–99	34.7	January 1899	3	December 1898–February 1899.
Spring 1897	15.4	March 1897	2	February–March 1897.
Early 1895	31.0	February 1895	3	February–April 1895.
1893–94	33.0	December 1893	2	December 1893–January 1894.
Spring 1893	35.5	April 1893	4	March–June 1893.
1891–92	98.5	January 1892	3	December 1891–February 1892.
Spring 1891	23.9	May 1891	3	April–June 1891.
Early 1890	34.8	January 1890	1	January 1890.

[1] See figs. 1, 2, and 3 and text for norms and methods used in computing excess mortality. Total actual excesses for whole epidemics as listed in this table are computed from data plotted in those charts. For names of the 35 and 90 cities and details about methods of computation, see preceding publications (*6, 7, 8, 11*). Massachusetts data are computed from annual reports (*13*).

epidemic months dropped considerably, but during the next decade the downward trend was negligible. Between 1930 and 1937 the rates in nonepidemic periods declined gradually, but after that time the decrease was considerably accelerated (*11*).

Periods of excess over expected mortality from influenza and pneumonia in groups of cities in the United States since 1910 are shown[2] in figures 1 and 2, and the total excess[3] for each epidemic is

[2] All rates in figs. 1, 2, and 3 are on an annual basis, but the heights of the peaks in the monthly data are not comparable with those in the weekly data because a month represents an average of 4⅓ weeks which would frequently include low as well as high weeks of an influenza epidemic.

[3] During epidemics, in addition to the mortality credited as primarily due to influenza and pneumonia as shown in figs. 1 and 2, considerable excess mortality credited to causes other than influenza and pneumonia occurs and usually has a peak in the same week as influenza and pneumonia. The chronic degenerative diseases contribute heavily to this excess mortality from causes other than influenza and pneumonia. In the pandemic of 1918–19, about 92 percent of the total excess mortality was credited to influenza and pneumonia, but in the epidemic of 1928–29 only 63 percent of the excess was so credited. In smaller outbreaks only about one-half, and in the epidemic of 1943–44 only about one-third of the total excess mortality from all causes was credited to influenza and pneumonia (*4*).

listed in table 1. The normal or expected rates used in computing the excess for the period 1916–19 were based on the median rate for each month during the 7-year period 1910–16, with no adjustment for trend. Similarly, for the period 1920–29 the expectancy was based on the median for each week during the 7-year period 1921–27, with no adjustment for trend. Therefore, from 1910 to 1930 there are periods of several months to a year where the rate is below expectancy, as in 1921 (figs. 1 and 2). In the period 1930–35 the trend from year to year was taken into account in computing expectancy; after 1935 the trend from quarter to quarter was taken into account. Thus in the years after 1935 the deviations represent short-time fluctuations from levels immediately before and after epidemics, so the longer periods of generally low or generally high rates outside of epidemics are not shown.

Although the excess mortality shown in figures 1 and 2 is based on deaths credited to influenza or pneumonia with no differentiation as to etiology, it is interesting to note the findings of laboratory studies of the causative agents in the several epidemics. About the time of and following the 1918 influenza pandemic there was a tendency to attribute the disease to the Pfeiffer, or influenza, bacillus. After much work on various organisms found in the nose and throat of influenza patients, the affection has been classified as a virus disease and two or more specific viruses have been identified (*9*, *10*, *16*). Virus A has been identified in cases occurring during the 1943–44 outbreak (*17*, *19*) and also in the epidemics of the winters of 1932–33, 1934–35, 1936–37, of the early spring of 1939, and of the winter of 1940–41. However, virus B was also found in the epidemic of the early spring of 1939, and the epidemics of early 1936 and of early 1940 have been attributed to virus B (*9*, *10*). Both viruses have been found in the same epidemic and occasionally in the same patient (*9*); in all epidemics tests in many cases have failed to identify either A or B virus (*16*). There appears to be no way to tell whether the disease which has been called influenza or grippe in the numerous epidemics preceding the work on influenza viruses was etiologically the same or different in the several epidemics.

Prior to 1910 data on mortality during influenza epidemics are not available for population groups representing the United States as a whole. For the State of Massachusetts mortality statistics (*13*) are available by months for 60 or more years, including the decade 1890–99 with its several epidemics. Figure 3 shows the chronology of these outbreaks in terms of excess mortality from influenza and pneumonia. The highest peaks occurred in January 1890, January 1892, and March 1900, but there was a total of 10 epidemics in the 12 years 1890–1901 and 2 smaller outbreaks in the next few years. Although most of these epidemics were not large, the total excess

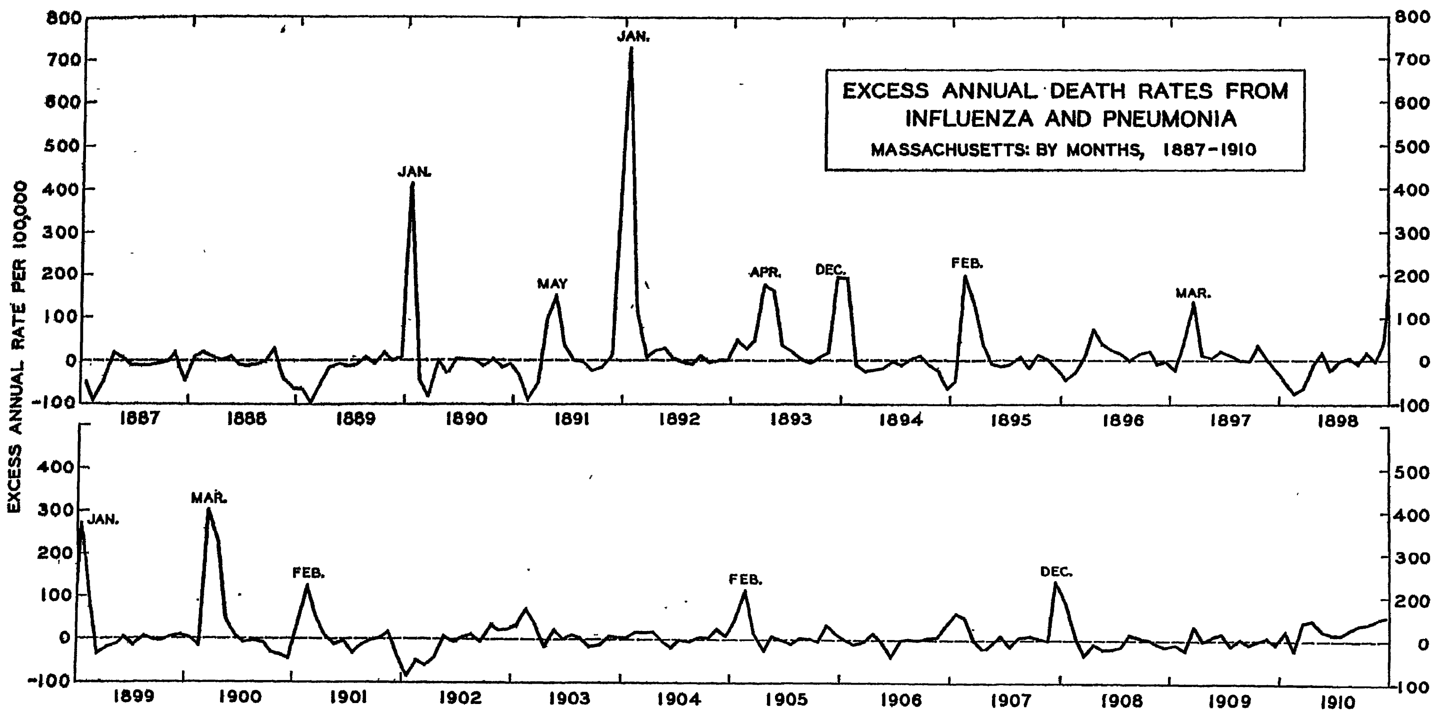

FIGURE 3.—Excess mortality from influenza and pneumonia in Massachusetts, 1887-1910. (Excess rates are deviations from median rate for corresponding month for period 1887-1917.)

mortality rate from influenza and pneumonia in Massachusetts during the epidemic of 1891–92 was of the order of magnitude of the epidemic of 1920, and other outbreaks approximated those of 1923, 1926, and 1928–29 in the groups of cities discussed above (table 1). In nearly every epidemic some sections of the country are more severely affected than others, so it is not possible to say whether the Massachusetts epidemics of 1889–1901 are typical of other regions. Whatever may have been the situation in the United States, the 1889–90 pandemic seems to have been very severe in other countries of the world (*15*).

THE EPIDEMIC OF 1943–44

General aspects.—In terms of excess deaths credited primarily to influenza and pneumonia the epidemic of 1943–44 was smaller than those of 1936–37 and 1932–33, which in turn were smaller than those of 1928–29 and 1926 (table 1). In addition to the 1943–44 mortality figures as reported to the United States Public Health Service by about 90 large and small representative cities and by 35 large cities of this group, data have been made available by the United States Bureau of the Census on a 10-percent mortality sample from nearly all States (*20*). Excess [4] rates during the whole epidemic are summarized below for the several groups:

Population group and source of data	Actual excess death rates per 100,000			
	Influenza and pneumonia		All causes	
	1943–44	1928–29	1943–44	1928–29
35 large cities (U. S. Public Health Service)	14.4	40.8	49.8	64.9
90 representative cities (U. S. Public Health Service)	15.6	44.4		
10-percent Census sample, 1943–44, and U. S. Registration States, 1928–29	14.0	59.0	44.2	81.6
10 large surveyed cities (U. S. Public Health Service)		63.4		99.7

The 1943–44 Census sample shows in addition to the 14.0 excess rate credited to influenza and pneumonia another 7.2 per 100,000 representing deaths in which influenza or pneumonia was the most important contributory cause. The inclusion of such contributory causes raises the excess mortality from influenza and pneumonia from 32 percent of the total for all causes to 48 percent. In the epidemic of 1928–29 the data for the 10 large surveyed cities showed 64 percent of the excess deaths from all causes credited primarily to influenza

[4] Excess over some normal expectancy; data were not available for computing same type of norm for all groups. Norm for 35 cities in 1943–44 is based on same weeks of the 2 preceding years; for 1928–29 it is based on 7-year medians for same weeks (*4*). Norm for 90 cities is based on same weeks of several preceding years. (See fig. 2 and ref. 6, 8, and 11 for details). Norms for Census sample, registration States, and 10 surveyed cities are all based on the same weeks or months of the preceding year. Influenza and pneumonia deaths refer to those credited primarily to those causes.

and pneumonia, and 80 percent credited primarily or secondarily to these two diseases.

Only 29 percent of the excess mortality in 1943–44 in the group of 35 large cities was credited primarily to influenza and pneumonia, as compared with 63 percent in the epidemic of 1928–29. Thus, in terms of excess mortality from all causes in this group of cities, the 1943–44 outbreak amounted to 77 percent of the rather important epidemic of 1928–29, but in terms of excess mortality credited primarily to influenza and pneumonia it amounted to only 35 percent of that epidemic. Weekly excess rates for the 35 cities, as shown in the middle section of figure 4, indicate that the peak of excess mortality from all causes in the outbreak of 1943–44 (week ending January 1) was actually above the peak of 1928–29 (week ending January 12), but at no time did the excess credited to influenza and pneumonia in these cities approach that of 1928–29 (left section of fig. 4). However, in all weeks except the peak and the preceding week the excess rates from all causes were well below those of 1928–29. The right section of figure 4 shows excess mortality credited to influenza and pneumonia in some recent epidemics for which data are not readily available for the 35 cities.

Since such a large percentage of the total excess mortality in the epidemic of 1943–44 was credited primarily to causes other than influenza and pneumonia, it is of interest to determine the larger of these other causes. Computations based on the Census Bureau's Current Mortality Analysis for December 1943 and January 1944 (*20*) indicate that of the excess mortality not credited primarily to influenza and pneumonia, 71 percent was credited primarily to cardiovascular-renal diseases, 11 percent to cancer, 6 percent to diabetes,

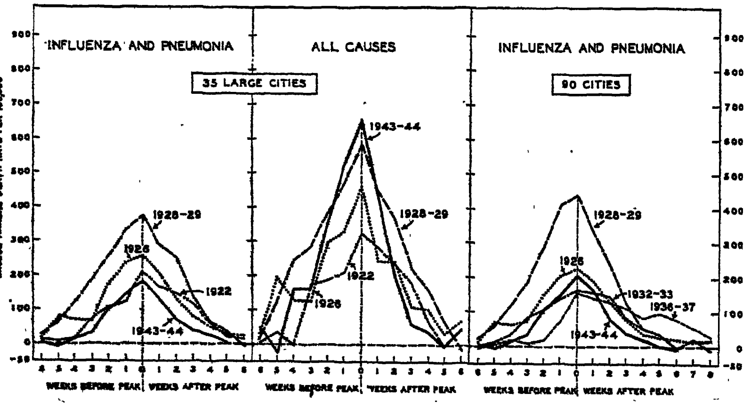

FIGURE 4.—Weekly excess mortality from influenza and pneumonia and from all causes in groups of cities in the epidemic of 1943–44, as compared with preceding epidemics, 1922–37. (Norms and data for all groups are as described in figure 2 except that in the 35 cities the excess rates for 1943–44 are over corresponding weeks of the preceding year. See references 4 and 7 for tables of rates for 35 cities; 1922 excesses are corrected for low rates immediately before and after the epidemic.)

and the other 12 percent to other causes. Thus in the 1943–44 outbreak, as in other epidemics since 1920 (*4*), the great majority of the excess deaths not credited to influenza and pneumonia refer to the chronic degenerative diseases which, at least in prior epidemics, showed a definite peak in the same week as influenza and pneumonia. While one would not expect an "epidemic" of these chronic diseases, it might frequently happen that a person long afflicted with such a malady would be a victim of an attack of influenza or pneumonia which was of such transient nature, as compared with the chronic disease, that it was not noted on the death certificate or if noted was not considered of primary importance. The influenza of 1943–44 was of a mild character and the sulfa drugs were available for the treatment of complicating pneumonia. Most of the deaths occurred in the older ages and probably among persons already suffering from chronic disease; this situation may have led to more than the usual confusion as to the primary cause of death.

Age curves of excess mortality.—In few localities is mortality routinely tabulated by month, age, and cause. Therefore, it is difficult to obtain data on influenza and pneumonia deaths by age for the specific period of an epidemic, particularly with similar data for a nonepidemic period covering the same season of the year (*14*). However, such data are available for the 2-month period of the 1943–44 epidemic in the 10-percent Census sample, and for the 3-month period of the 1928–29 epidemic in the survey of 10 large cities. The numbers of deaths from influenza and pneumonia in relatively small canvassed populations are usually too few to afford any reliable indication of the age curves of mortality from these causes during epidemic periods (*1*, *2*, *3*, *5*).

Actual age-specific death rates from influenza and pneumonia and from all other causes during the December-January 1943–44 epidemic and similar rates for the corresponding months of 1942–43 are given in table 2 and shown on a semilogarithmic chart in figure 5. The fact that the lines (right section of fig. 5) for causes other than influenza and pneumonia are so close together for the two periods indicates that the percentage excess for these causes was small, but it is seen in the middle section of the figure that the actual excesses for these other causes were larger than those for influenza and pneumonia among children 5 to 20 years [5] and among persons over 65 years of age. As already noted, the excess mortality at all ages credited primarily or secondarily to influenza and pneumonia amounted to only 48 percent of the excess mortality from all causes.

The age curve of influenza and pneumonia excess mortality in the 10-percent sample for the epidemic of 1943–44 is compared with that

[5] Irregularities at the younger ages in the excess rates for causes other than influenza and pneumonia are probably not significant. Rates at these ages are small and the small fluctuations appear large on a ratio chart.

TABLE 2.—*Excess mortality from influenza and pneumonia and from all causes during the 2 months December–January 1943–44 over December–January 1942–43, as derived from a 10-percent sample of death certificates in 43 States* [1]

Age (years)	Actual death rate [2] per 100,000 for 2 months, December-January								Excess death rate [2] per 100,000 for December-January 1943-44 over December-January 1942-43				
	1943-44				1942-43								
	Influenza and pneumonia				Influenza and pneumonia				Influenza and pneumonia				
	Sole or primary	Contributory	All other causes	All causes	Sole or primary	Contributory	All other causes	All causes	Sole or primary	Contributory	Sole, primary, or contributory	All other causes	All causes
All ages	28.6	13.7	189.4	231.7	14.6	6.5	166.4	187.5	14.0	7.2	21.2	23.0	44.2
Under 5	50.5	12.3	129.7	192.5	47.8	7.7	142.3	197.8	2.7	4.6	7.3	−12.6	−5.3
5–9	2.8	1.1	13.3	17.2	1.6	.3	9.2	11.1	1.2	.8	2.0	4.1	6.1
10–14	2.0	.4	11.6	14.0	.9	.5	10.6	12.0	1.1	−.1	1.0	1.0	2.0
15–24	3.6	.8	31.1	35.5	2.2	.9	25.5	28.6	1.4	−.1	1.3	5.6	6.9
25–34	4.7	2.2	42.5	49.4	3.4	1.1	40.2	44.7	1.3	1.1	2.4	2.3	4.7
35–44	9.9	4.4	76.8	91.1	5.8	2.5	72.5	80.8	4.1	1.9	6.0	4.3	10.3
45–54	22.9	8.4	176.6	207.9	11.8	5.4	166.0	183.2	11.1	3.0	14.1	10.6	24.7
55–64	38.9	22.4	377.2	438.5	21.3	12.9	359.7	393.9	17.6	9.5	27.1	17.5	44.6
65–74	98.5	68.1	864.6	1,031.2	42.1	30.5	765.0	837.6	56.4	37.6	94.0	99.6	193.6
75 and over	430.7	218.1	2,453.5	3,102.3	146.5	85.2	1,983.5	2,215.2	284.2	132.9	417.1	470.0	887.1
Total deaths,[3] all ages	3,336	1,596	22,140	27,072	1,714	764	19,482	21,960	1,622	832	2,454	2,658	5,112

[1] Data from U. S. Bureau of the Census (*20*). District of Columbia is included; States not included are Arkansas, Connecticut, Georgia, Minnesota, New Hampshire, and Texas. Data represent a retabulation of deaths occurring in December and January with delayed certificates included.

[2] Rates for December-January 1943-44 were based on estimated de facto populations for Jan. 1, 1944, and rates for December-January 1942-43 were based on estimated de facto populations for Jan. 1, 1943; excess rates represent differences between these two sets of rates. De facto populations include the armed forces within the continental United States but not those outside.

[3] Figures in this line in the excess rate section of the table are the actual numbers of excess deaths.

of 1928–29 in the group of 10 cities for which detailed data for the specific period of that epidemic are available (left section of fig. 5). Although the actual differences between the excesses in 1928–29 and 1943–44 are largest in the older ages, the relative differences are greater in the younger ages.

TWO METHODS OF COMPUTING AGE CURVES OF EXCESS MORTALITY

Since there are only a few places in which deaths are tabulated by cause, age, and month or week, data are not commonly available on the age curve of influenza and penumonia during the specific period of an outbreak. A rougher method of using data for calendar years may be feasible when applied with caution. A comparison of the two methods of computing age curves of excess mortality in one outbreak is given in detail in this section.

In connection with a study of the 1928–29 epidemic, deaths from influenza and pneumonia for the whole of 10 large surveyed cities (*3*, *5*) were copied from the records of the city registrars for the year 1928

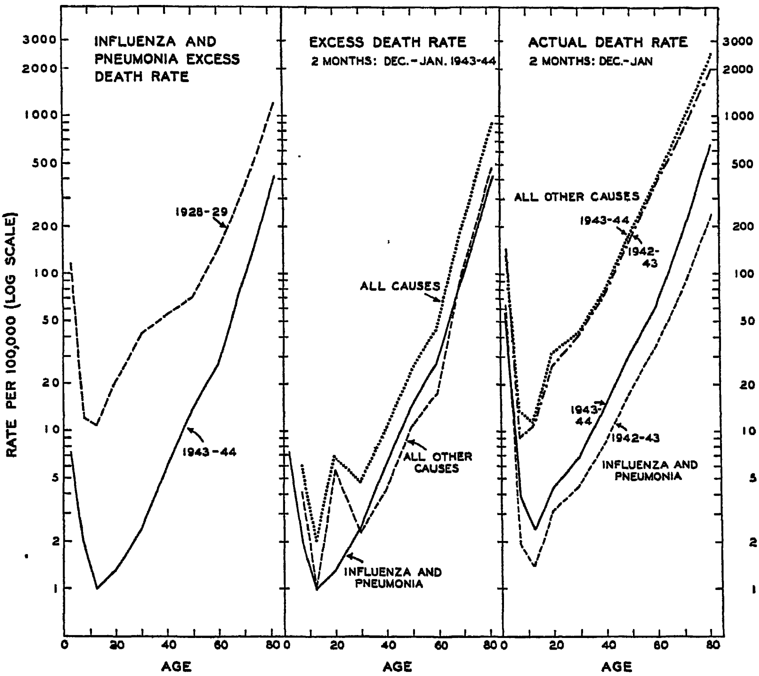

FIGURE 5.—Age-specific actual and excess mortality from influenza and pneumonia (sole, primary, and contributory) and from all other causes in the epidemic of 1943–44—10-percent Census sample (20) of the United States, 1943-44 (table 2); 10 cities, 1928–29 (table 3). (Excess over same months of preceding year.)

and to the end of the epidemic early in 1929. The data so copied include all certificates on which influenza or pneumonia of any form was recorded as a sole, primary, or contributory cause of death (table 3).

Actual death rates from influenza and pneumonia at specific ages for the 3 months December–February 1928–29, as compared with a similar period in 1927–28, are shown on a logarithmic vertical scale in the middle section of figure 6. The 1927–28 months were relatively free from influenza and give some idea of the age curve of mortality from influenza and pneumonia at this season of the year in a relatively normal period. It is seen that the relative age curve of mortality in this winter epidemic of 1928–29 is fairly similar to that for the normal winter period of 1927–28.

Death rates from influenza and penumonia for the whole of the calendar years 1928 and 1929 which shared the epidemic, and the whole of the adjacent calendar years 1927 and 1930 which were relatively free from epidemics, are plotted in the right section of figure 6. As might have been expected from the showing for the 3-month periods, these two age curves are also similar.

Two curves of excess death rates are shown in the left section of figure 6; one is based on the 3-month periods and the other on the 2-

TABLE 3.—*Excess mortality from influenza and pneumonia in the whole population of 10 cities* [1] *(a) during the 3 months December–February 1928–29 over December–February 1927–28, and (b) during the calendar years 1928 and 1929 over the calendar years 1927 and 1930*

Age (years)	Mortality in 3-month periods in whole population of 10 surveyed cities: Actual death rate per 100,000 for 3 months December-February—: 1928–29 [2]: Sole or primary	1928–29 [2]: Contributory	1927–28 [3]: Sole or primary	1927–28 [3]: Contributory	Excess rate per 100,000 for December-February 1928–29 over December-February 1927–28: Sole or primary	Excess rate: Contributory	Estimated population [4] in thousands on January 1—: 1929	1928	Mortality for calendar years (sole or primary): 10 surveyed cities [5]: Actual death rate per 100,000: 1928, 1929	1927, 1930	10 surveyed cities: Excess rate per 100,000 for 1928+1929 over rate for 1927+1930	Registration States [6]: Excess rate per 100,000 for 1928+1929 over rate for 1927+1930
All ages	112.7	33.3	49.3	17.0	63.4	16.3	4,847.6	4,790.6	365.8	289.6	76.2	84.3
Under 5	299.6	33.2	190.7	25.1	108.9	8.2	358.8	354.6	1,233.6	1,055.8	177.8	171.4
5–9	19.3	4.1	8.7	2.5	10.6	1.5	397.9	393.2	80.9	68.7	12.2	17.7
10–14	15.1	3.7	4.6	3.4	10.6	.3	379.1	374.7	48.9	39.8	9.1	13.5
15–24	31.3	5.7	13.4	2.7	17.9	3.0	850.9	840.8	97.9	66.3	31.6	28.7
25–34	51.3	10.4	16.0	4.5	35.4	5.9	863.2	853.1	146.6	111.4	35.2	38.6
35–44	78.6	15.9	29.7	10.1	48.9	5.7	785.6	776.4	242.1	192.3	49.8	60.7
45–54	106.2	30.9	48.4	17.9	57.8	12.9	589.9	582.9	352.4	284.2	68.2	72.7
55–64	186.8	71.8	78.3	36.0	108.5	35.8	366.7	362.4	606.8	477.3	129.5	103.8
65–74	414.9	193.4	176.8	91.9	238.1	101.6	189.3	187.1	1,224.2	910.3	313.9	289.0
75 and over	1,254.4	587.9	396.5	234.4	857.9	353.5	66.2	65.4	3,286.4	2,501.4	785.0	1,248.7

[1] The 10 cities were Baltimore, Boston, Cincinnati, Des Moines, Kansas City, Mo., New Orleans, Pittsburgh, San Francisco, Seattle, and Syracuse (*3*). Data on deaths by age (primary and contributory causes) were copied from city health department records and may differ somewhat from final totals later tabulated for all ages by the Census Bureau; no final figures are available by age and month.

[2] Deaths by age for influenza and pneumonia in the several cities were available only to a time shortly after the end of the epidemic of 1928–29. In 4 cities (San Francisco, Seattle, Kansas City, and Cincinnati) deaths from these causes were not available by age for the last few weeks of the period, but were available for all ages by weeks (*21*). The 421 deaths for the weeks not available by age in these 4 cities were assumed to be distributed by age like the 5,042 deaths of known ages in the 10 cities; deaths by age had been tabulated only for all cities combined. Similar figures for influenza and pneumonia as contributory causes of death are an estimate of 124 for the weeks not available by age in the 4 cities and 1,489 deaths of known ages in the 10 cities.

[3] Deaths by age for influenza and pneumonia were not available for December 1927. From another source deaths for all ages from these causes were available by weeks (*21*); the total (primary causes) for all ages for the 3 months December–February 1927–28 amounted to 1.432 times that for the 2 months January–February 1928. Death rates by age for January–February 1928 were multiplied by this factor to obtain estimated rates here given for December–February 1927–28. This process is equivalent to assuming that the 713 deaths (primary causes) in December 1927 were distributed by age like the 1,650 in January and February 1928. Similar figures for influenza and pneumonia as contributory causes of death are an estimate of 245 for December 1927, and 567 deaths of known ages for January and February 1928.

[4] Populations as of January 1 for the 10 cities are computed from Census Bureau intercensal estimates, distributed by age according to the 1930 census of the 10 cities.

[5] Populations for calendar year data for the 10 cities are Census Bureau intercensal estimates as of July 1 of 1927, 1928, and 1929, distributed by age according to the 1930 census; populations for 1930 are enumerated populations of April 1, 1930.

[6] Populations for specific ages in the registration States are from Vital Statistics Rates, 1900–40 (*18*): 10-year age groups in that volume are broken into 5-year groups in proportion to the 1930 census.

year periods. Although not identical, the two curves of excess mortality from influenza and pneumonia are generally similar.

There are, however, some definite limitations to the use of rates for whole calendar years to obtain approximations of age-specific excess rates:

1. The use of the method depends upon finding a nearby year with influenza and pneumonia death rates of approximately the same level as in nonepidemic months of the year which includes the epidemic. Since influenza and pneumonia

deaths for all ages are available by months in the annual mortality reports from the Bureau of the Census, this condition can be tested.

2. Since the calendar year includes various seasons with the possibility of varying age curves, the "calendar year norm" must be based on a sufficiently large area or on a sufficient number of years to average out some of the variations. It was found in the data for the 10 surveyed cities that deaths credited to bronchopneumonia, lobar pneumonia, and influenza were all somewhat different in age distribution.[6] It was also found that as judged by the chi-square (χ^2) test the age distributions for influenza and pneumonia of all forms combined were frequently different for the several seasons of the year, although the variation was sometimes minor.

[6] Deaths credited primarily to influenza and pneumonia were available by age for the whole of the 10 large cities surveyed in 1928–29 (*3*). The chi-square (χ^2) test was applied to the age distributions as follows:

1. The 10 months January–October 1928 (normal period) were divided into 2-month periods, January–February, March–April, May–June, July–August, September–October, and the age distributions of the deaths in each period from influenza and pneumonia (all forms) were tested against those of every other period. Thus a total of 10 pairs of distributions were tested with the following probabilities that the two distributions in the pair were from the same universe:

Influenza and pneumonia (all forms):

8 pairs different ($P=0.038$ or less).

2 pairs not different (January–February with March–April, $P=0.114$, and January–February with July–August, $P=0.147$).

2. The 10 months January–October 1928 (normal period) were divided into 3 periods, January–March, April–June, July–October, and the age distributions of the deaths in each period from influenza, from bronchopneumonia, and from lobar pneumonia were tested against those of every other period. Thus a total of 3 pairs of distributions for each diagnosis were tested with the following probabilities that the two distributions in the pair were from the same universe:

1928	Influenza	Bronchopneumonia	Labor pneumonia
January - March with April–June.	Not different ($P=0.210$).	Not different ($P=0.831$).	Different ($P=0.010$).
January - March with July–October.	Doubtful ($P=0.078$).	Different ($P=0.000$).	Not different ($P=0.295$).
April - June with July–October.	Not different ($P=0.102$).	Different ($P=0.000$).	Not different ($P=0.573$).

Summarizing 1 and 2, age distributions of deaths credited to influenza and pneumonia (all forms) and of those credited to bronchopneumonia tend to vary from season to season in this nonepidemic year, but age distributions of deaths credited to influenza and of those credited to lobar pneumonia tend to be more stable.

3. The age distributions of deaths from influenza and pneumonia (all forms) were tested as follows:

January 1928 with January 1929: different ($P=0.000$)

February 1928 with February 1929: not different ($P=0.259$)

March 1928 with March 1929: different ($P=0.003$)

4. The age distributions in the epidemic period November 1928–March 1929 were tested against the nonepidemic period January–March 1928 (November–December 1927 not available) for influenza, bronchopneumonia, and lobar pneumonia separately. Results for all three diagnoses indicated different distributions in the two periods ($P=0.008$ or less).

5. For the epidemic period November 1928 to March 1929 and for the nonepidemic period January to March 1928 (November–December 1927 not available) the age distributions were tested as follows: Influenza with bronchopneumonia, influenza with lobar pneumonia, and bronchopneumonia with lobar pneumonia. Results for all three tests in both periods indicated different distributions for the pairs of diagnoses ($P=0.006$ or less).

"Different" as used throughout this note means greater variation between the age distributions of the two groups tested than would be expected by chance in the numbers of deaths involved. Because the numbers are large, some of the differences may be too small to be of any practical importance even though "statistically significant."

In spite of these difficulties, the method of obtaining approximate age-specific excess rates from data for whole calendar years may be feasible when applied with caution.

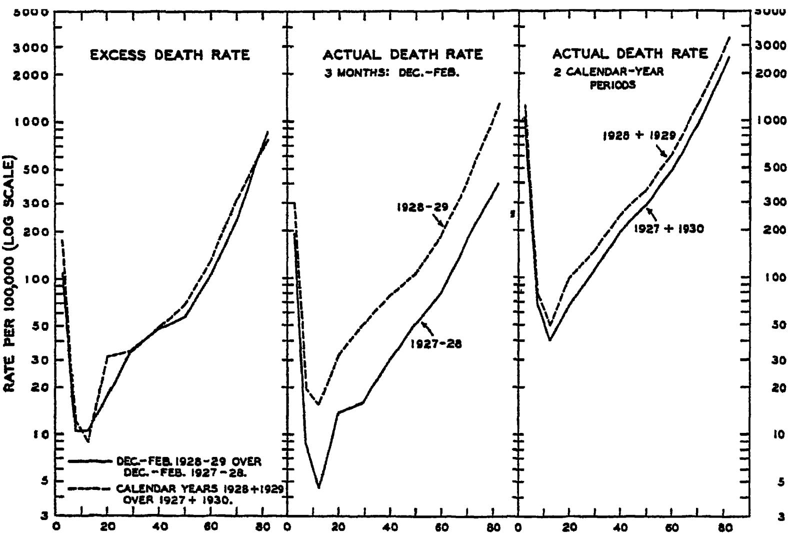

FIGURE 6.—Age-specific actual and excess mortality from influenza and pneumonia (sole or primary causes) in the epidemic of 1928–29 as computed from data for calendar years and from data for the 3-month period of the outbreak—whole population of 10 large surveyed cities. (See table 3 for details about norms and data.)

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(*To be concluded*)

AN OUTBREAK OF *SALMONELLA* INFECTION IN MAN FROM INFECTED CHICKEN EGGS [1]

By James Watt, *Surgeon, United States Public Health Service*

In January 1945, an American merchant vessel arrived at the port of New Orleans and reported an outbreak of acute diarrheal disease aboard ship which had begun approximately 12 hours before arrival. Investigation revealed the following facts.

The first case began about 5 a. m. on January 14 and during the next 24 hours 15 more cases appeared. At the time of the inspection on January 15, a total of 18 men in the crew of 70 merchant seaman and naval armed guard reported gastrointestinal symptoms of varying degrees of severity. Six of the men were severely ill, with nausea, vomiting, fever, malaise, abdominal pain, and a profuse watery diarrhea without gross exudate. One of these men had loss of sphincter control for about 12 hours. The others had occasional involuntary bowel movements. All six were confined to their bunks for 24 to 36 hours. The remaining sick men were less severely ill, with abdominal pain the only constant finding. Diarrhea occurred in all but two cases. Symptoms in the milder cases lasted less than 24 hours and even the most severe ones were definitely improved by the end of the second day.

Stool cultures were obtained by the rectal swab technique, described

[1] From the Division of Infectious Diseases, National Institute of Health, and the Charity Hospital of Louisiana, at New Orleans.

elsewhere (*1*), on 67 men. (The captain, purser, and a supercargo were ashore at the time.) The cultures were seeded on a single S. S. agar plate and the swab was then placed in a tube of tetrathionate broth. *Salmonella montevideo* was isolated from all individuals giving a history of illness during the period of the outbreak. In addition, 10 other crew members had a positive culture for the same *Salmonella* type. Of these 10 men, 2 were apparently incubatory carriers, since they developed gastroenteric symptoms a few hours after the cultures were obtained; 1 had reported an acute diarrhea 2 days before the main outbreak but was apparently well at the time the culture was made; and the other 7 gave no history of illness and must be classed as passive carriers.

The explosiveness of the outbreak indicated a single source of infection, probably food. The menus offered during the preceding week were obtained and the men were questioned about these meals. The evening meal of January 13 was found to be the most probable source of infection. The menu is listed below:

Grilled pork chops	Cold cuts, cheese
Veal pot pie	Egg and olive salad
Macaroni au gratin	Cake, loganberries
Baked potatoes	Coffee, tea

All but three of these foods were eliminated from further suspicion, since very few of the sick individuals had eaten any of them. The three foods eaten by most of the sick men were (1) pork chops, (2) egg salad, and (3) cake. Twenty-six of the twenty-eight men with positive stool cultures stated that they had eaten pork chops, 26 that they had eaten egg salad, and all said they had eaten cake. Of 30 men with negative cultures from whom a similarly exact history was obtained, 27 had eaten pork chops, none had eaten egg salad, and 29 had eaten cake.

These findings indicated that the egg salad was the food probably responsible for the outbreak. It consisted of hard-boiled eggs, olives, pickles, and mayonnaise. The latter was made aboard ship in the usual manner, with the yolks of raw eggs, salad oil, vinegar, lemon juice, mustard, and salt.

The mayonnaise and salad were made by the chief steward. His stool culture was positive for *S. montivideo*. It is believed that this was a result of contamination rather than the cause, since he ate a portion of salad at the evening meal and was one of the men who developed a clinical illness. If he had been a carrier of this infection it seems unlikely that ingestion of the contaminated salad would have resulted in illness. Only one other member of the steward's department had a positive culture and he too had eaten the salad and was clinically ill. All other members of this department denied eating any of the salad, and none had positive stool cultures.

None of the prepared foods used in the meal were left aboard but there were four cases of eggs and some pork loins still in storage. (Storage facilities were excellent and properly cared for, as evidenced by the following facts: (a) The meat was frozen, (b) cabbage and carrots were in good condition after 2½ months on board, (c) the eggs, on candling, showed only slight shrinkage or other signs of deterioration.) Samples of the pork and all the eggs were taken for culture purposes.

The pork was chopped and placed in tetrathionate broth. Cultures of this broth did not show any microbial growth.

As a preliminary step, one case of eggs (30 dozen) was broken out into sterile flasks, using chiefly the yolks, and incubated overnight. The material in these flasks was subcultured to S. S. agar and tetrathionate broth. Both direct plating and the tetrathionate enrichment revealed *S. montevideo* in 11 of the 14 flasks.

No attempt was made in this particular case to distinguish between shell contamination and internal contamination of the eggs, the technique of breaking for culture being that used by a cook in the ordinary course of kitchen duties. Subsequently, eggs from the remaining cases were cultured. These eggs were first washed in physiological saline warmer than the eggs and then soaked in cresol solution, 4 percent, for one-half hour before they were cracked for culture. Several additional isolations of *S. montevideo* were made from one of the cases of eggs so treated. The saline wash water on culture showed coliform bacilli, pseudomonas, and cocci, but no salmonellae were isolated. No salmonellae were isolated from either the shell or the interior of eggs in the other two cases.

Although most of the culture work was done by pooling a number of eggs, those eggs which showed gross evidence of deterioration were cultured individually by placing a portion of the yolk in a tetrathionate broth tube. The majority of the spoilage was due to cracking or mold invasion. Occasionally black rot was found. Of 47 eggs examined in this manner, one yielded *S. montevideo;* the remainder either showed one or more of the common causes of egg rot or failed to show any growth on the media used.

The eggs, together with all other food supplies, had been obtained from a ship's chandler in Norfolk, Va., just prior to sailing. They were taken aboard on November 8, 1944. It was possible by checking the records of the Norfolk produce house to ascertain that these eggs were part of a carload shipment originating in southern Iowa on October 26, 1944. Three egg-grading plants had contributed to this particular shipment. An attempt was made to determine the actual farm or farms from which the eggs might have originated and, incidentally, to see how widespread the infection might be in the production area served by these plants. This work is still in progress.

Two methods of survey were employed:

(1) One hundred forty-three farms in the area were visited in February 1945, and cultures obtained from fresh chicken droppings in tetrathionate broth. Thirty to forty small samples were taken from each chicken house, placed in the broth, and, after incubation, subcultured to S. S. agar. *S. pullorum* was isolated from 12 of these farms and *S. derby* from 1. *S. montevideo* was not encountered.

(2) Samples of eggs were taken for culture from each batch sold to the candling plant. The samples were cultured in batches according to source. To date more than 5,000 eggs from approximately 850 farms have been cultured. *S. montevideo* has not been isolated from any of these samples. *S. pullorum* and *gallinarum* have been encountered frequently. Two other *Salmonella* types, *S. cholerae suis* (var. Kunzendorf), and *S. derby*, have been isolated from shell eggs in this manner.

DISCUSSION

Fowl have been recognized for many years as a reservoir of *Salmonella* infection. Edwards states that fowls are the greatest reservoir of paratyphoid infection in the United States and reported (*2*) in 1939 the results of typing 223 cultures obtained from fowl in this country, 54 from chickens. *S. montevideo* was one of the types obtained. In December 1944, the British Medical Journal (*3*) editorially discussed eggs and *Salmonella* infections, summarizing recent knowledge on this subject. They concluded that while a complete case had been made against ducks as a source of *Salmonella* in man, only a "nonproven" verdict could be returned against the chicken. Salmonellae have been isolated from chickens and from frozen dehydrated eggs. In the latter case particularly interesting work has been published in a series of articles (*4*) on dried whole egg powder in Canada. Gibbons and Moore (*5*) found a number of *Salmonella* types in dried egg powder but the source of the infection was not definitely established, i. e., whether from the interior, the exterior, or by some other means in the process of preparation. In spite of the findings quoted above and their definite implications, reports of outbreaks of salmonellosis in man traced to chickens or shell eggs have not been encountered in the literature on the subject.

SUMMARY

An outbreak of salmonellosis (*S. montevideo*) aboard a merchant vessel, affecting 28 individuals in a crew of 70, is reported.

Twenty-one individuals were known to have had symptoms of varying severity and from each *S. montevideo* was isolated. The same organism was isolated from seven additional members of the crew, none of whom reported any illness.

Epidemiological evidence indicated that infection resulted from the consumption of contaminated egg salad, the mayonnaise of which contained raw eggs.

The same *Salmonella* type, *S. montevideo*, was isolated from two cases of shell eggs obtained on the ship. Internal contamination of the eggs was demonstrated, since the shell washings before sterilization were free of *S. montevideo*, and egg meats obtained after sterilization of shells were found to contain this organism.

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THE SUSCEPTIBILITY OF THE GOLDEN HAMSTER (*CRICETUS AURATUS*) TO TULAREMIA [1]

By CARL L. LARSON, *Passed Assistant Surgeon, United States Public Health Service*

The golden hamster (*Cricetus auratus*) has not been subjected to experimentation to determine its relative susceptibility to inoculations of *Pasteurella tularensis*. Johnson (*1*) found hamsters to be susceptible to experimental infections with this organism. Sarchi (*2*) detected spontaneous infections of tularemia among hamsters (*C. C. frumentaris*) in the Ob River Basin, and Schmidt (*3*) states, "*Bacterium tularense* is carried to man by hares, rabbits, squirrels, mice, rats, water-rats, hamsters, etc., directly through contact, ——." Lillie and Francis (*4*) review the findings of Dvijkoff concerning the pathology of tularemia in a naturally infected hamster. Organisms microscopically identified as *P. tularensis* were observed in hamsters (*C. cricetus*) in the Ukraine by Schuller and Erdmann (*5*). It is thus apparent that hamsters are susceptible to such infections, but it appears desirable to define their degree of susceptibility to this disease as compared to that of mice, and to establish the pathologic picture in this species.

Preliminary studies had shown that golden hamsters were about as susceptible as white Swiss mice to tularemia. With these observations in mind it was determined to measure the degree of susceptibility of mice and hamsters to such infections. Mice weighing about 15 gm.

[1] From the Division of Infectious Diseases, National Institute of Health.

were selected and hamsters 5 to 6 weeks of age were used. All animals were bred and maintained at the National Institute of Health. A 10-percent suspension in 0.85-percent salt solution of liver and spleen tissue from a guinea pig dying in the second passage of material obtained from the sputum of an individual (S. A.) suffering from the ulcero-glandular type of tularemia was prepared. Serial tenfold dilutions of the original 10-percent guinea pig tissue suspension were made in salt solution to an end point of 10^{-12}. Dilutions were made into conical glasses containing 4.5 cc. of salt solution, and 0.5 cc. of material was transferred using a fresh pipette for each dilution. Groups of five mice and five hamsters each were inoculated intraperitoneally with 0.3 cc. of the respective dilutions from 10^{-1} to 10^{-12}. The animals were observed for 2 weeks before the experiment was terminated. The 50-percent lethal dose of organisms contained in this suspension was 2.4×10^{-8} for mice and 4.0×10^{-8} for hamsters.

Another experiment was designed to test quantitatively the susceptibility of mice and hamsters to intraperitoneal and subcutaneous introduction of organisms, to determine the susceptibility of hamsters to tularemia when inoculated by intranasal, intramuscular, or intracranial routes, and to determine the influence of human convalescent serum on the course of the infection.

A specimen of serum from a patient convalescent from tularemia and having an agglutination titre of 1:640 against *P. tularensis* was used. This was administered in 0.3-cc. doses intraperitoneally to 10 hamsters at the same time they received an infectious dose of organisms by the same route. The organisms employed were obtained from the sputum of a person suffering from the pulmonary type of tularemia (R. H. P.). Organisms grown for 48 hours on the slanted surface of a tube of glucose cystine blood agar were suspended in sufficient 0.85-percent NaCl solution to make a suspension having a density of T-500 on a Fuller's earth scale. This suspension was considered to be a 10^{-0} suspension of organisms. Serial tenfold dilutions were made in salt solution to an end point of 10^{-10}. The same types of animals used in the previous experiment were employed. These were inoculated as follows:

Groups of 6 mice each intraperitoneally or subcutaneously with doses of 0.3 cc. of each dilution from 10^{-1} to 10^{-10}, groups of 5 hamsters each intraperitoneally or subcutaneously with doses of 0.3 cc. of each dilution from 10^{-1} to 10^{-10}, groups of 5 hamsters with 0.3-cc. doses of 10^{-2} and 10^{-6} dilutions intramuscularly, groups of 5 hamsters each with 0.03-cc. doses at 10^{-2} and 10^{-6} dilutions intracranially or intranasally, a group of 10 hamsters simultaneously with 0.3-cc. of human convalescent serum and 0.3-cc. of a 10^{-6} dilution of organisms, and a lot of 20 hamsters with 0.3-cc. of a 10^{-6} dilution of organisms intra-

peritoneally. All animals were observed for 3 weeks before being discarded.

The results obtained indicated that immune serum as here employed had no influence upon the course of experimental tularemia in hamsters. All of the hamsters treated with serum died, eight within 4 days following inoculation. The other two died on the seventh and eleventh day, respectively, after exposure to infection. There were no survivors among the hamsters inoculated intracerebrally, intranasally, or intramuscularly with a 10^{-2} dilution of organisms. Among those hamsters inoculated with a 10^{-6} dilution of a suspension of *P. tularensis* intramuscularly all hamsters died, four of five inoculated intracerebrally succumbed, but no deaths were recorded among the five animals inoculated intranasally.

The titrations of organisms in mice and hamsters infected either intraperitoneally or subcutaneously illustrated that the degree of susceptibility of hamsters to experimental exposure to tularemia is as great as that of mice (table 1). Hamsters appeared to be equally susceptible to infection induced by either route of inoculation.

TABLE 1.—*The susceptibility of golden hamsters* (Cricetus auratus) *and white Swiss mice to intraperitoneal or subcutaneous inoculation of 0.3-cc. amounts of serial tenfold dilutions of a virulent strain (R. H. P.) of* P. tularensis

Species of animal inoculated	Route of inoculation	Number of animals inoculated with each dilution of culture	50-percent lethal end point
Hamster	Intraperitoneal	5	$1.5 \times 10^{-}$[illegible]
Do	Subcutaneous	5	1.5×10^{-8}
Mouse	Intraperitoneal	6	1.8×10^{-7}
Do	Subcutaneous	6	3.2×10^{-7}

The gross and microscopic pathology, based on a series of 25 hamsters derived from the above groups, is being reported separately (*6*).

SUMMARY

The susceptibility of hamsters to tularemia approximates that of white mice. They are equally susceptible to subcutaneous and to intraperitoneal inoculation.

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COURT DECISION ON PUBLIC HEALTH

Local registrar of vital statistics—payment of fees to.—(Texas Court of Civil Appeals; *City of Taylor et al.* v. *Hodges et al.*, 183 S.W.2d 664; decided October 25, 1944, rehearing denied November 8, 1944.) For a period of a little more than two years the city of Taylor paid the statutory registration fees authorized under the Texas law to the local registrar for births and deaths. Such fees, amounting to $566.50, had been voluntarily paid by the city to the local registrar under a mistake of law, upon the assumption that the city owed them, and had been paid without the request, knowledge, or consent of the county. The city sued certain county officers in their official capacities to recover such statutory fees, and the conclusion reached by the court of civil appeals of the State was that the city could not recover from the county. It was pointed out by the court that no county officer did anything which could constitute fraud, imposition, or deception against the city and that the latter was charged with knowledge of the law prescribing the amount of the debt to the local registrar and by whom it should be paid. As there was no legal liability upon the city to pay the local registrar and as the city had paid him with knowledge of all the facts, "such payment must be deemed to have been wholly voluntary on the part of the city." Continued the court: "The uniform rule in such cases is that the city could not recover it back because paid under a mistake of law."

DEATHS DURING WEEK ENDED JUNE 23, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 23, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	9,111	8,557
Average for 3 prior years	8,532	
Total deaths, first 25 weeks of year	234,564	238,970
Deaths under 1 year of age	603	621
Average for 3 prior years	597	
Deaths under 1 year of age, first 25 weeks of year	15,347	15,653
Data from industrial insurance companies:		
Policies in force	67,379,078	66,635,780
Number of death claims	12,544	12,227
Death claims per 1,000 policies in force, annual rate	9.7	9.6
Death claims per 1,000 policies, first 25 weeks of year, annual rate	10.9	10.6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JUNE 30, 1945

Summary

Of the total of 155 cases of poliomyelitis reported for the current week, as compared with 116 for the preceding week, 220 for the corresponding week last year, and 79 for the 5-year (1940–44) median, 103 occurred in 6 States reporting more than 5 cases each, as follows (last week's figures in parentheses): New York 16 (16), South Carolina 8 (5), Tennessee 6 (2), Alabama 7 (8), Texas 54 (39), California 12 (9). The current week is the second successive week in which a smaller number of cases was reported than for the corresponding week last year. The difference is 65 for the current week as compared with 9 for the preceding week.

The total for the first 26 weeks of the year is 1,270, as compared with 1,002 for the same period last year, and a 5-year median of 776. Of the total to date this year, 873 cases have been reported since March 17, the week of lowest reported incidence to date this year, as compared with 739 for the corresponding period last year.

Following declines during the past 4 weeks, the incidence of meningococcus meningitis increased. A total of 143 cases was reported, as compared with 122 last week, 179 for the corresponding week last year, and a 5-year median of 52. States reporting the largest numbers are New York (17), Michigan (11), Alabama (10), and California and Texas (9 each). The total to date is 5,416 as compared with 11,839 for the corresponding period last year and a 5-year median of 2,019.

Sylvatic plague infection was reported in Cheyenne County, Kans., during the week. This is the first reported infection in the State, and the locality is the farthest east in which the infection has been reported in wild rodents or their ectoparasites.

A total of 8,747 deaths was reported in 93 large cities in the United States during the current week, as compared with 9,111 last week, a 3-year (1942–44) average of 8,558, and 8,476 for the corresponding week last year.

Telegraphic morbidity reports from State health officers for the week ended June 30 1945, and comparison with corresponding week of 1944, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44
	June 30, 1945	July 1, 1944		June 30, 1945	July 1, 1944		June 30, 1945	July 1, 1944		June 30, 1945	July 1, 1944	
NEW ENGLAND												
Maine	1	0	0	------	------	------	2	111	111	0	1	1
New Hampshire	0	0	0	------	------	------	15	9	6	1	0	0
Vermont	0	0	0	------	------	------	22	1	55	0	0	0
Massachusetts	6	1	1	------	------	------	315	457	738	5	4	4
Rhode Island	0	0	0	25	------	------	6	20	53	1	0	0
Connecticut	2	0	0	1	------	------	54	141	141	1	7	2
MIDDLE ATLANTIC												
New York	13	7	13	[1] 1	[1] 3	[1] 3	152	609	686	17	27	9
New Jersey	2	2	3	1	4	4	48	344	714	3	5	3
Pennsylvania	3	4	7	------	------	------	407	182	260	8	6	3
EAST NORTH CENTRAL												
Ohio	9	4	6	1	3	3	35	35	90	6	6	1
Indiana	5	1	1	6	3	4	16	25	37	3	2	0
Illinois	0	3	12	3	2	11	373	81	185	7	6	0
Michigan [2]	11	7	5	4	------	------	181	259	692	11	12	1
Wisconsin	1	1	1	1	3	9	93	644	793	4	4	1
WEST NORTH CENTRAL												
Minnesota	2	11	4	------	------	------	9	67	66	1	5	1
Iowa	4	1	1	------	------	------	49	45	61	4	2	0
Missouri	2	1	1	2	1	------	36	23	31	3	5	1
North Dakota	7	0	0	2	------	------	1	0	9	0	0	0
South Dakota	2	0	0	------	------	------	15	1	3	1	0	0
Nebraska	1	1	1	1	------	------	7	20	20	0	1	1
Kansas	4	3	3	1	------	------	29	63	69	1	6	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	2	0	4	0	1	0
Maryland [2]	5	4	2	------	------	1	9	42	65	6	8	5
District of Columbia	0	0	0	------	------	------	1	30	30	0	0	0
Virginia	2	5	5	74	56	44	21	134	134	4	5	4
West Virginia	2	2	2	9	2	2	4	50	38	0	2	1
North Carolina	7	4	4	------	------	1	46	122	122	5	3	2
South Carolina	9	6	6	53	106	80	19	144	34	3	2	0
Georgia	1	3	3	62	3	3	0	11	25	1	1	1
Florida	1	3	2	------	1	1	10	46	22	1	3	2
EAST SOUTH CENTRAL												
Kentucky	3	0	1	------	5	2	39	31	31	0	6	3
Tennessee	1	1	2	3	4	5	20	11	35	4	1	1
Alabama	3	2	6	6	16	3	1	16	62	10	3	1
Mississippi [2] *	8	3	2	------	------	------	------	------	------	2	1	0
WEST SOUTH CENTRAL												
Arkansas	2	1	2	2	27	1	27	33	28	5	0	0
Louisiana	4	7	4	------	4	2	27	8	8	1	1	1
Oklahoma	3	0	0	9	12	9	14	45	39	0	2	1
Texas	28	30	15	338	249	249	208	442	196	9	11	3
MOUNTAIN												
Montana	0	5	0	------	------	------	4	15	31	1	1	1
Idaho	1	0	0	------	------	------	3	4	10	0	1	0
Wyoming	0	0	0	------	------	------	4	14	14	0	0	0
Colorado	5	2	7	12	45	9	8	69	61	1	1	1
New Mexico	6	3	2	1	1	------	6	12	12	0	0	0
Arizona	0	0	0	38	28	30	0	14	25	1	0	0
Utah [2]	1	1	0	------	------	------	205	41	50	1	1	0
Nevada	0	0	0	------	------	------	1	2	2	0	0	0
PACIFIC												
Washington	10	2	4	2	1	------	185	137	133	2	4	1
Oregon	10	1	2	1	1	3	33	53	48	0	0	0
California	18	27	11	13	12	36	667	1,371	362	9	22	9
Total	205	159	143	672	592	592	3,429	6,034	6,619	143	179	52
26 weeks	6,738	5,578	6,314	66,474	335523	166,672	91,224	576,549	509,829	5,418	11,839	2,019

*Report for current week not received.

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended June 30, 1945, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	June 30, 1945	July 1, 1944		June 30, 1945	July 1, 1944		June 30, 1945	July 1, 1944		June 30, 1944	July 1, 1944	
NEW ENGLAND												
Maine	0	0	0	28	5	6	0	0	0	1	1	1
New Hampshire	0	1	0	2	0	1	0	0	0	0	0	0
Vermont	0	0	0	6	3	3	0	0	0	0	0	0
Massachusetts	2	0	0	104	153	147	0	0	0	4	5	4
Rhode Island	0	0	0	2	1	5	0	0	0	0	1	1
Connecticut	1	0	0	20	23	23	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	16	25	4	309	176	176	0	0	0	3	3	6
New Jersey	5	2	0	32	60	60	0	0	0	0	1	2
Pennsylvania	1	6	1	161	113	113	0	0	0	3	4	10
EAST NORTH CENTRAL												
Ohio	5	6	1	126	95	82	0	0	0	4	2	8
Indiana	3	0	0	29	20	20	0	0	0	3	1	1
Illinois	2	2	2	114	59	62	0	0	2	2	3	3
Michigan [2]	0	0	1	104	64	85	0	0	0	2	4	3
Wisconsin	0	2	0	82	68	60	1	0	0	0	1	0
WEST NORTH CENTRAL												
Minnesota	1	5	1	42	38	25	0	0	0	0	0	0
Iowa	1	0	0	21	17	13	0	0	0	0	1	1
Missouri	2	1	1	15	12	12	0	0	0	1	2	5
North Dakota	0	0	0	9	8	3	2	3	0	0	0	0
South Dakota	0	0	0	1	8	4	0	0	0	1	0	0
Nebraska	0	0	0	10	9	8	0	0	0	0	0	0
Kansas	1	1	1	41	17	17	0	0	0	0	3	3
SOUTH ATLANTIC												
Delaware	1	0	0	1	1	2	0	0	0	0	0	1
Maryland [2]	1	1	0	31	24	20	0	0	0	0	1	1
District of Columbia	3	0	0	13	17	7	0	0	0	2	0	0
Virginia	5	6	1	45	16	12	0	0	0	15	3	4
West Virginia	2	1	0	26	21	13	0	0	0	3	0	2
North Carolina	5	83	1	32	12	11	0	0	0	4	0	4
South Carolina	8	2	2	2	2	2	0	0	0	9	5	5
Georgia	1	2	1	1	7	7	0	0	0	6	9	13
Florida	1	6	1	4	4	3	0	0	0	18	4	2
EAST SOUTH CENTRAL												
Kentucky	3	29	0	19	10	19	0	0	0	3	5	8
Tennessee	6	1	1	13	8	18	0	0	0	10	2	11
Alabama	7	1	1	5	5	5	0	0	0	9	1	3
Mississippi [2]*	0	3	2	2	7	3	0	0	0	4	2	6
WEST SOUTH CENTRAL												
Arkansas	1	4	3	7	3	2	0	0	0	3	7	8
Louisiana	1	4	2	5	4	5	0	0	0	2	2	12
Oklahoma	3	2	1	18	3	4	1	0	0	1	2	2
Texas	54	5	4	48	34	25	0	0	0	15	21	17
MOUNTAIN												
Montana	0	0	0	2	17	6	0	0	0	1	1	0
Idaho	0	0	0	0	4	2	0	0	0	1	1	1
Wyoming	0	0	0	5	3	4	1	0	0	1	0	0
Colorado	0	1	1	17	23	15	0	0	0	1	3	1
New Mexico	0	0	0	5	2	2	0	0	0	1	2	2
Arizona	0	0	0	10	8	4	0	0	0	2	0	0
Utah [2]	0	0	0	10	19	5	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	0	0	0	21	45	13	0	0	0	0	1	1
Oregon	1	5	0	17	23	4	0	1	0	0	1	1
California	12	13	13	188	202	75	0	0	0	0	6	4
Total	155	220	79	1,805	1,473	1,415	5	4	14	136	111	166
37 weeks	1,270	1,002	776	127,915	141,393	92,168	245	267	576	1,733	2,115	2,378

*Report for current week not received.

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately as follows: Massachusetts 3; New York 1; Ohio 1; Virginia 2; North Carolina 1; Georgia 1; Tennessee 1; Texas 1.

Telegraphic morbidity reports from State health officers for the week ended June 30, 1945, and comparison with corresponding week of 1944 and 5-year median—Continued.

Division and State	Whooping cough: Week ended— June 30, 1945	Whooping cough: Week ended— July 1, 1944	Whooping cough: Median 1940–44	Week ended June 30, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever	Undulant fever
NEW ENGLAND											
Maine	100	11	19	0	0	0	0	0	0	0	1
New Hampshire	0	0	0	0	0	0	0	0	0	0	0
Vermont	11	20	20	0	0	0	0	0	0	0	2
Massachusetts	107	52	144	0	1	0	0	0	0	0	1
Rhode Island	28	10	13	0	0	0	0	0	0	0	0
Connecticut	53	33	33	0	0	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	258	142	270	2	3	0	0	1	0	0	4
New Jersey	174	70	118	0	0	0	0	0	0	0	2
Pennsylvania	214	66	287	0	0	0	0	1	0	0	1
EAST NORTH CENTRAL											
Ohio	127	227	236	0	1	0	0	0	0	0	2
Indiana	33	30	30	0	0	1	0	2	0	0	2
Illinois	81	62	117	1	0	0	1	0	2	0	5
Michigan [3]	44	66	179	1	0	0	0	0	0	0	7
Wisconsin	48	71	129	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota	7	9	34	5	0	0	0	0	0	0	5
Iowa	1	12	32	0	0	0	0	0	0	0	0
Missouri	23	29	29	0	0	0	0	0	0	0	0
North Dakota	0	5	6	0	0	0	0	0	0	0	1
South Dakota	4	0	7	0	0	0	0	0	0	0	1
Nebraska	2	13	13	0	0	0	0	0	0	0	0
Kansas	17	52	54	0	0	0	0	0	0	0	5
SOUTH ATLANTIC											
Delaware	0	1	4	0	0	0	0	0	0	0	0
Maryland [3]	70	83	83	0	0	0	1	2	0	0	1
District of Columbia	22	3	9	0	0	0	0	0	0	0	0
Virginia	67	50	67	1	0	122	0	4	1	0	0
West Virginia	24	14	57	0	0	0	0	1	0	0	0
North Carolina	287	190	190	0	0	0	2	4	0	1	2
South Carolina	96	123	50	1	62	0	0	0	0	2	0
Georgia	19	18	17	2	11	1	0	2	0	28	5
Florida	3	33	11	0	0	0	0	0	0	9	2
EAST SOUTH CENTRAL											
Kentucky	44	93	69	0	0	0	0	1	0	0	0
Tennessee	30	25	58	1	0	7	1	0	2	0	1
Alabama	21	30	30	3	0	0	0	2	0	9	1
Mississippi [3] *	------	------	--------	0	0	0	0	0	1	2	3
WEST SOUTH CENTRAL											
Arkansas	10	23	22	0	7	0	1	0	8	0	0
Louisiana	3	0	10	1	1	0	0	0	0	13	2
Oklahoma	22	7	16	0	1	0	0	0	1	0	1
Texas	264	254	274	18	605	58	0	0	0	63	36
MOUNTAIN											
Montana	4	8	13	0	0	0	0	0	0	0	0
Idaho	9	4	4	0	0	0	0	1	0	0	1
Wyoming	0	2	5	1	0	0	0	0	0	0	0
Colorado	28	31	24	0	0	0	0	3	0	0	1
New Mexico	8	2	17	1	0	0	0	0	0	0	0
Arizona	11	12	19	0	0	21	0	0	0	0	2
Utah [3]	31	63	70	0	0	0	0	1	0	0	5
Nevada	0	0	0	0	0	0	0	1	0	0	0
PACIFIC											
Washington	11	19	61	0	0	0	0	0	0	0	1
Oregon	17	9	23	0	0	0	0	0	0	0	0
California	240	93	203	2	4	0	0	0	0	0	4
Total	2,673	2,170	3,370	40	696	210	6	26	15	127	116
Same week 1944	2,170	------	--------	79	823	474	10	26	20	118	95
Average, 1942–44	3,151	------	--------	49	600	316	10	[4] 18	16	[4] 53	------
25 weeks: 1945	65,092	------	--------	833	11,677	3,307	180	153	405	1,598	2,425
1944	47,504	------	--------	755	8,856	2,900	284	172	300	1,410	1,792
Average, 1942–44	84,011	------	[4] 98,514	743	6,134	2,163	265	[4] 184	426	[4] 1,007	------

*Report for current week not received.

[3] Period ended earlier than Saturday.

[4] 5-year median, 1940–44. *Leprosy:* California, 1 case. *Weil's disease:* Maryland, 2 cases.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 23, 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	2	0	------	0	0	0	3	0	2	0	0	9
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	4	0	0	0
Vermont:												
Barre	0	0	------	0	24	0	0	0	0	0	0	0
Massachusetts:												
Boston	0	0	------	0	138	2	3	0	32	0	0	17
Fall River	0	0	------	0	0	0	0	1	3	0	0	4
Springfield	0	0	------	0	1	0	0	0	16	0	0	0
Worcester	0	0	------	0	47	0	7	0	7	0	0	4
Rhode Island:												
Providence	0	0	------	0	17	0	2	0	5	0	0	18
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	3	0	0	0
Hartford	0	0	------	0	20	0	1	0	3	0	0	0
New Haven	0	0	------	0	0	0	1	0	1	0	0	13
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	1	1	4	1	10	0	1	0
New York	10	0	4	0	107	7	59	7	139	0	1	73
Rochester	0	0	------	0	2	1	6	0	15	0	0	7
Syracuse	0	0	------	0	1	1	1	0	11	0	0	47
New Jersey:												
Camden	0	0	------	0	17	0	3	0	0	0	0	1
Newark	0	0	------	0	1	1	6	2	7	0	0	14
Trenton	1	0	------	0	10	0	3	0	0	0	0	0
Pennsylvania:												
Philadelphia	3	0	------	0	551	4	25	0	30	0	0	103
Pittsburgh	0	0	------	0	0	0	4	1	18	0	0	4
Reading	0	0	------	0	2	0	2	0	4	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	5	2	7	0	8	0	0	15
Cleveland	1	0	1	0	10	1	7	1	22	0	0	24
Columbus	0	0	------	0	0	0	0	0	5	0	0	5
Indiana:												
Fort Wayne	0	0	------	0	1	0	1	0	1	1	0	0
Indianapolis	4	0	------	0	5	0	6	0	8	0	0	0
South Bend	0	0	------	0	0	0	0	0	2	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	1	0	0	0
Illinois:												
Chicago	0	0	2	0	245	6	17	1	52	0	0	22
Springfield	0	0	------	1	0	0	0	0	3	0	0	0
Michigan:												
Detroit	4	1	1	0	150	3	11	0	59	0	2	22
Flint	0	0	------	0	1	0	1	0	5	0	0	1
Grand Rapids	0	0	------	0	3	0	1	0	5	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	17	0	0	0	2	0	0	0
Milwaukee	0	0	------	0	28	0	2	0	33	0	0	1
Racine	0	0	------	0	2	0	0	0	2	0	0	8
Superior	0	0	------	0	14	0	0	0	0	0	0	6
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	2	0	4	0	0	1
Minneapolis	0	0	------	0	0	0	4	0	19	0	0	1
St. Paul	0	0	------	2	3	0	3	0	6	0	0	5
Missouri:												
Kansas City	2	0	------	1	5	0	4	0	2	0	0	0
St. Joseph	0	0	------	0	1	0	0	0	2	0	0	0
St. Louis	0	0	3	1	2	3	6	0	8	0	2	11

City reports for week ended June 23, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0		0	4	0	3	0	8	0	0	
Kansas:												
Topeka	0	0		0	0	0	0	0	6	0	0	3
Wichita	0	0		0	3	1	1	0	5	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	4	0	1	0	0	
Maryland:												
Baltimore	5	0	1	0	5	1	9	1	13	0	0	67
Cumberland	0	0		0	0	0	1	0	1	0	0	0
Frederick	0	0		0	1	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0		0	4	0	9	0	18	0	1	8
Virginia:												
Lynchburg	0	0		0	1	0	0	0	0	0	0	0
Richmond	0	0		0	6	0	1	0	4	0	1	0
Roanoke	1	0		0	0	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0		0	0	0	0	0	0	0	0	4
Wheeling	0	0		0	2	0	1	0	1	0	0	1
North Carolina:												
Raleigh	0	0		0	1	0	2	0	0	0	0	5
Wilmington	0	0		0	1	0	0	0	1	0	0	9
Winston-Salem	0	0		0	0	0	2	0	5	0	0	15
South Carolina:												
Charleston	1	0		0	0	0	2	0	1	0	0	0
Georgia:												
Atlanta	0	0	1	1	1	0	0	1	3	0	0	1
Brunswick	0	0		0	0	0	0	0	0	0	0	0
Savannah	0	0		0	1	0	2	0	0	0	0	0
Florida:												
Tampa	0	0		0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	19	1	5	0	2	0	0	5
Nashville	0	0		2	0	0	3	0	2	0	0	1
Alabama:												
Birmingham	0	0		0	0	1	2	4	0	0	1	3
Mobile	0	0		0	0	0	1	1	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	0	0	0	0	0	2
Louisiana:												
New Orleans	3	0	6	0	13	2	10	0	4	0	2	2
Shreveport	0	0		0	0	0	4	0	0	0	0	0
Texas:												
Dallas	1	0		0	3	0	1	1	2	0	0	2
Galveston	0	0		0	0	0	1	4	0	0	0	0
Houston	0	0		0	1	1	6	5	1	0	1	0
San Antonio	4	0	1	0	0	0	3	1	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0		0	1	0	2	0	0	0	0	0
Great Falls	0	0		1	0	0	0	0	1	0	0	0
Helena	0	0		0	0	0	0	0	1	0	0	0
Missoula	0	0		0	0	0	0	0	0	0	1	0
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	5	0	3	0	5	2	4	0	0	11
Pueblo	0	0		0	0	0	0	0	2	0	0	3
Utah:												
Salt Lake City	0	0		0	63	0	0	0	3	0	0	13

City reports for week ended June 23, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	34	1	2	0	15	0	0	0
Spokane	3	0	4	0	5	0	1	0	1	0	0	0
Tacoma	0	0	------	0	36	0	0	0	3	0	1	0
California:												
Los Angeles	2	0	1	0	85	1	4	1	44	0	0	33
Sacramento	8	0	------	0	9	1	2	0	13	0	0	4
San Francisco	2	0	------	0	169	2	5	1	26	0	0	15
Total	58	1	30	9	1,903	44	298	36	751	1	14	648
Corresponding week, 1944	64	------	11	8	1,685	-----	241	------	619	0	20	482
Average, 1940–44	53	------	30	[1] 9	[2] 3,170	-----	[1] 257	------	661	0	22	1,041

[1] 3-year average, 1942–44. [2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New Haven, 1; New York, 2; Los Angeles, 1; San Francisco, 1.
Dysentery, bacillary.—Cases: Providence, 1; New York, 3; Chicago, 2; Charleston, S. C., 10; Los Angeles, 2.
Dysentery, unspecified.—Cases: San Antonio, 14.
Leprosy.—Cases; Seattle, 1.
Rocky Mountain spotted fever.—Cases: St. Louis, 1; Lynchburg, 1.
Tularemia.—Cases: St. Louis, 1.
Typhus fever, endemic.—Cases: Savannah, 1; Birmingham, 2; New Orleans, 2; Galveston, 1; Houston, 3; San Antonio, 3; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,366,400)

	Diphtheria case rates	Encephalitis, infectious, case rates[1]	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	0.0	0.0	646	5.2	44.4	2.6	199	0.0	0.0	170
Middle Atlantic	6.5	0.0	1.9	0.0	320	6.9	52.3	5.1	108	0.0	0.9	116
East North Central	5.4	0.6	2.4	0.6	292	7.3	32.2	1.2	126	0.6	1.2	64
West North Central	4.0	0.0	6.0	8.0	38	8.0	46.3	0.0	121	0.0	4.0	44
South Atlantic	11.4	0.0	3.3	1.6	38	1.6	57.2	3.3	78	0.0	3.3	181
East South Central	0.0	0.0	0.0	11.8	112	11.8	64.9	29.5	30	0.0	5.9	53
West South Central	23.0	0.0	20.1	0.0	49	8.6	71.7	31.6	20	0.0	8.6	20
Mountain	0.0	0.0	39.7	7.9	532	0.0	55.6	15.9	87	0.0	7.9	214
Pacific	25.3	0.0	7.9	0.0	535	7.9	22.1	3.2	161	0.0	1.6	82
Total	8.8	0.2	4.6	1.4	290	6.7	45.3	5.5	114	0.2	2.1	99

PLAGUE INFECTION IN CHEYENNE COUNTY, KANS., AND SAN BENITO COUNTY, CALIF.

Plague infection has been reported proved in a pool of 105 fleas from white-footed mice (*Peromyscus*, sp.), meadow mice (*Microtus*, sp.), and harvest mice (*Reithrodontomys*, sp.), all taken on June 2 from a location on an unmarked road in Cheyenne County, Kans., 5 miles east of a point on Highway No. 61, 5 miles south of Benkleman, Nebr.

This is the first reported instance of plague infection in Kansas, and the locality is the farthest east in which the infection has been found in wild rodents or their ectoparasites in the United States. The farthest east that such infection had previously been reported was Cimmaron County, Okla., where plague infection was found in 1944 in fleas from wood rats and white-footed mice collected 20 miles southwest of Boise City.

Plague infection was also reported proved on June 22, 1945, in 4 specimens of fleas and ticks from ground squirrels (*C. beecheyi*) in San Benito County, Calif., at locations distant from Tres Pinos, as follows: 192 fleas from 57 ground squirrels, 7 miles east and 3 miles south; 400 fleas from 62 ground squirrels, 13 miles southeast; 400 fleas and 9 ticks from 37 ground squirrels, 7 miles east and 5 miles south; 200 fleas from 23 ground squirrels, 8 miles east and 5 miles south.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended June 16, 1945.—During the 4 weeks ended June 16, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	6	Poliomyelitis	2
Chickenpox	112	Puerperal fever	1
Diphtheria	31	Syphilis	271
Dysentery	23	Tetanus	13
Filariasis	5	Tetanus, infantile	2
Gonorrhea	235	Tuberculosis (all forms)	590
Influenza	105	Typhoid fever	32
Leprosy	1	Typhus fever (murine)	16
Malaria	304	Whooping cough	87
Measles	75		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 9, 1945.—During the week ended June 9, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	20	28	2	168	375	67	38	54	83	835
Diphtheria	1	1	2	19	1	1	1	------	------	26
Dysentery, bacillary	------	------	------	3	------	------	------	------	1	4
Encephalitis, infectious	------	------	------	------	1	1	------	1	------	3
German measles	------	6	------	10	47	------	11	50	38	162
Influenza	------	13	------	------	41	4	------	------	6	64
Measles	2	9	------	173	125	24	31	94	242	700
Meningitis, meningococcus	------	------	2	2	1	1	------	------	1	7
Mumps	------	6	------	192	233	60	34	93	24	642
Poliomyelitis	------	------	------	------	------	------	------	1	1	2
Scarlet fever	------	------	8	57	85	15	11	14	23	213
Tuberculosis (all forms)	------	4	3	134	42	17	16	34	64	314
Typhoid and paratyphoid fever	------	------	------	10	5	------	1	2	------	18
Undulant fever	------	------	------	4	3	------	------	2	2	11
Venereal diseases:										
Gonorrhea	1	34	13	89	151	62	24	34	59	467
Syphilis	------	22	2	127	90	9	6	10	28	294
Whooping cough	2	------	1	135	30	5	1	18	20	212

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YFLLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

China—Chungking.—During the week ended June 30, 1945, cholera was said to be still spreading in Chungking, China.

Plague

Canada—Alberta Province.—During the week ended June 23, 1945, plague infection was reported in 1 squirrel and in fleas from squirrels found near Pollockville, and in fleas from squirrels found near Carolside, Alberta Province, Canada.

France—Corsica—Ajaccio.—For the week ended June 23, 1945, 1 case of plague was reported in Ajaccio, Corsica, France, making a total of 5 cases reported since the beginning of the outbreak.

Great Britian—Malta.—For the week ended June 30, 1945, 4 cases of plague were reported in Malta.

Portugal—Azores.—For the week ended June 2, 1945, 1 case of plague was reported in the Azores, Portugal.

Smallpox

Belgian Congo.—Smallpox has been reported in Belgian Congo as follows: Weeks ended—May 12, 1945, 193 cases, 3 deaths; May 19, 1945, 701 cases, 4 deaths; May 26, 1945, 64 cases, 2 deaths.

British East Africa—Tanganyika.—For the week ended May 26, 1945, 136 cases of smallpox were reported in Tanganyika, British East Africa.

Sudan (French).—For the period June 1–10, 1945, 78 cases of smallpox were reported in French Sudan.

Typhus Fever

Algeria.—For the period May 11–20, 1945, 44 cases of typhus fever were reported in Algeria, including 5 cases reported in Algiers and 1 case in Oran.

Egypt.—For the week ended May 26, 1945, 782 cases of typhus fever with 111 deaths were reported in Egypt. For the week ended May 12, 1945, 77 cases of typhus fever with 23 deaths were reported in Cairo, 4 cases were reported in Port Said, 6 cases were reported in Ismailiya, and 1 case in Damietta. For the week ended April 28, 1945, 1 case of typhus fever was reported in Suez.

Germany.—A report received June 23, 1945, stated that 12,000 cases of typhus fever had been reported from 200 towns in various parts of Germany.

Guatemala.—For the month of May 1945, 143 cases of typhus fever with 14 deaths were reported in Guatemala. Departments reporting the highest incidence are: Alta Verapaz, 38 cases, 4 deaths; Quezaltenango, 30 cases, 4 deaths; San Marcos, 20 cases, 3 deaths.

Nigeria—Jos.—During the week ended June 23, 1945, typhus fever was reported to be prevalent in Jos, northern Nigeria.

Turkey.—For the week ended June 23, 1945, 42 cases of typhus fever were reported in Turkey, including 1 case in Istanbul, 2 cases in Kocaeli, 1 case in Trabzon, and 1 case in Zonguldak.

Yellow Fever

Gold Coast—Nsawam.—On June 13, 1945, 1 fatal case of yellow fever was reported in Nsawam, Gold Coast.

Sierra Leone—Moyamba.—On June 13, 1945, 1 case of suspected yellow fever was reported in Moyamba, Sierra Leone.

Venezuela—Tachira State—Morotuto.—For the week ended June 30, 1945, 1 confirmed case of yellow fever was reported in Morotuto, near La Grita, Tachira State, Venezuela.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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INFLUENZA AND PNEUMONIA EXCESS MORTALITY AT SPECIFIC AGES IN THE EPIDEMIC OF 1943-44, WITH COMPARATIVE DATA FOR PRECEDING EPIDEMICS[1]—Concluded

By SELWYN D. COLLINS, *Head Statistician, United States Public Health Service*

AGE CURVES OF EXCESS MORTALITY BASED ON CALENDAR YEARS

Registration States, 1910-44.—Almost the only available mortality data by age for earlier epidemics in the United States are for entire calendar years. The age curves of mortality from influenza and pneumonia in various calendar years in which epidemics occurred are shown on logarithmic vertical scales in figure 7, along with a nearby calendar year which was relatively free from influenza and can be assumed to show the age curve for a relatively normal year. The years relatively free from influenza in the United States that were used as "normal" in these computations were 1914, 1924, 1930,[7] and 1934. Table 4 shows by age both the actual death rates and the excess obtained by subtracting rates for corresponding ages in the nearby normal year from the rates for the calendar year which included the epidemic. Since all rates in the table are for single calendar years, the subtractions give results which represent actual excess rates (not annual basis), even though the original rates are designated as annual rates. The excess rates are plotted on arithmetic scales in figure 8 and on a logarithmic vertical scale in figure 9.

The great difference between the age curves of influenza and pneumonia mortality during the years 1918, 1919, and 1920 and those in more normal years is evident from figure 7 without any calculation of excess rates. However, in the more minor epidemics since 1920 it is not easy to judge accurately the nature of the age curve of excess death rates without the aid of figure 8 where the scales are arranged so that the various curves are comparable on a relative basis. Figure 9 with the logarithmic vertical scale further emphasizes the small variations at the low parts of the curves.

[1] This is the second and final section of a paper on influenza and pneumonia excess mortality. The first section appeared in the PUBLIC HEALTH REPORTS, 60: 821-835 (1945). The numbering of tables, figures, and footnotes is consecutive throughout. References will be found at the end of the first section.

[7] The death rate from influenza and pneumonia in 1927 was practically identical with that in 1930 but the latter year was used in the present calculations. The small epidemic of the winter of 1930-31 was practically all in 1931.

Excess rates in 1918–19 show the well-known curve of that pandemic with the highest peak in the young adult ages at 25 to 29 years. The next highest rate is among children under 5 years of age. The excess decreases rapidly as age increases above the young adult peak, and above 70 years there is no excess over the rate for 1914. In figure 7 it is seen that the relative age curves for 1918 and 1919 are similar.

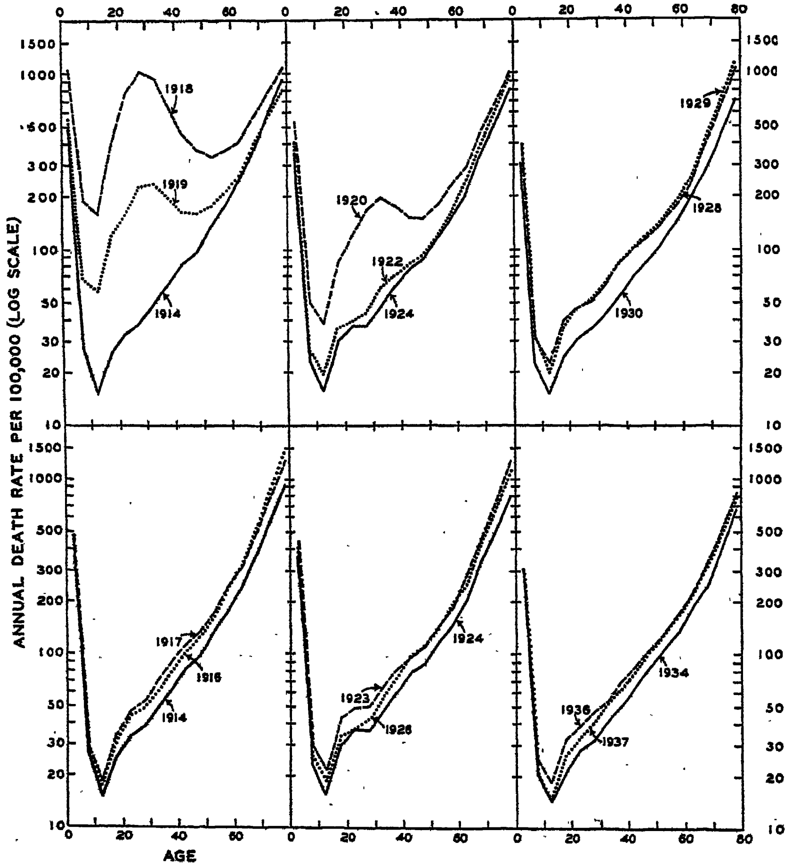

FIGURE 7.—Age-specific mortality from influenza and pneumonia in the United States during certain epidemic and nonepidemic calendar years, 1914–37. (Years 1914, 1924, 1930, and 1934 are used as "normal" years with which epidemic years in the same box of the chart are compared.)

Influenza and pneumonia mortality was on a somewhat lower level in nonepidemic months after 1919 than prior to 1918, but there was no large change during the next decade. The calendar year 1924 was therefore used as a normal year for comparsion with 1920. In terms of actual excess rates the whole 1920 curve is far below that of 1918–19. However, the 1920 curve shows a definite young adult peak at 30 to 34 years but it is not as high as the excess rate for children under 5 years or for persons above 70 years of age (figs. 8 and 9).

The 1920 curve of excess deaths from influenza and pneumonia, therefore, is similar to that of 1918–19 in its young adult peak, but similar to that of 1928–29 in having its greatest excesses among children and old people.

The age curve of excess mortality from influenza and pneumonia during the 1922 epidemic shows a very small peak at 30 to 34 years that looks somewhat like that of 1920, particularly on the relative basis of the semilogarithmic chart (fig. 9). However, the excess death rates among children under 5 and persons above 70 years of age greatly exceed the rates at this small young adult peak. The excess death rates for 1923 and for 1926 over those for 1924, and the excess of the rates for 1928 plus 1929 over twice the rate for 1930 show nothing that could be interpreted as a young adult peak, the highest excesses appearing in the youngest and oldest age groups. In each of these calendar years the excess rate for children under 5 is greater than in any age group under 60 years. However, the excess curve for 1936 plus 1937 over twice the rate for 1934 shows a relatively low rate for children under 5 years. The same is true of the excess during December–January 1943–44 over the same months of 1942–43 and also of the excess of 1917 over the rate for the calendar year 1914 (figs. 8 and 9). However, all of these epidemics were small in terms of mortality and the curves are subject to considerable chance variation.[8]

The preceding discussion and computations consider excess mortality rates in terms of the actual amount of the rate obtained by subtracting some normal rate from that during an epidemic. Excess mortality might be looked upon from the point of view of the percentage rather than the actual amount of the excess. For example, instead of computing the amount of the excess of 1920 over corresponding age groups of 1924, there might have been computed the percentage that the rates for 1920 were in excess of rates for corresponding age groups in 1924. Such percentages were computed for the several epidemics and are shown graphically in figure 10. Because it is the shape of the curves rather than the actual values that are being compared, the scales in figure 10 are adjusted to put the curves on the same relative basis.

[8] It might be thought that the chi-square (χ^2) test could be applied to the age distributions of deaths from influenza and pneumonia in pairs of years to determine whether distributions in the epidemic years were significantly different from those in nonepidemic years. However, the numbers of deaths in the registration States, even in the earlier years, are so large that a negligible variation from any practical standpoint comes out as "statistically significant," i. e., as more than would be expected by chance.

The chi-square test was applied to the age distributions of deaths from influenza, from pneumonia (all forms), and from influenza and pneumonia combined, with the following results:

(1) years 1915, 1916, 1917, 1918, and 1919 each paired with 1914.

(2) years 1920, 1922, 1923, and 1926 each paired with 1924.

(3) years 1914 and 1924 paired.

In every case and for each disease group the differences are statistically significant; in some years the differences are very large but in others they are too small to have any practical significance. Thus the χ^2 test does not seem to be applicable where the numbers involved are extremely large.

TABLE 4.—*Influenza and pneumonia*[1] *mortality among persons of specific ages*[2] *in certain calendar years, and the excess over rates for corresponding ages during calendar years without excessive mortality from these diseases*

UNITED STATES

Age	All registration States						Registration States of 1920					Registration area				
	1937	1936	1934	1930	1929	1928	1926	1924	1923	1922	1920	1919	1918	1917	1916	1914
	Annual death rate per 100,000															
All ages	114.9	119.6	96.9	102.5	146.5	142.5	142.4	116.9	153.6	132.6	207.4	221.9	577.9	166.3	163.5	136.0
Under 5	290.2	304.8	290.7	309.2	391.2	390.9	409.4	356.3	429.0	408.4	528.5	547.5	1,033.5	480.0	466.0	474.8
5–9	21.5	25.3	21.6	22.4	31.3	31.7	26.7	23.6	29.7	27.9	51.5	69.0	189.1	29.9	28.1	27.8
10–14	14.6	18.7	14.2	15.1	20.1	23.0	18.4	15.6	21.7	19.2	38.2	56.7	160.0	18.3	17.0	14.8
15–19	26.0	32.6	21.3	24.8	36.0	39.2	33.6	30.3	42.7	35.4	84.6	118.8	391.9	33.8	31.9	25.8
20–24	33.0	38.8	28.1	30.9	46.4	46.7	37.5	36.9	48.1	39.2	118.8	163.2	770.4	46.8	43.6	33.4
25–29	40.7	46.5	32.0	35.7	52.9	51.1	42.8	36.5	49.5	43.7	168.5	229.3	1,022.3	52.6	47.9	38.0
30–34	51.3	53.9	41.0	42.4	64.1	62.5	57.3	47.1	65.1	59.3	197.3	240.0	949.4	70.5	60.0	48.8
35–39	64.0	70.5	50.7	54.1	84.4	84.4	74.3	61.0	81.4	71.7	177.1	197.5	649.5	89.9	79.4	63.2
40–44	80.9	85.7	65.0	69.2	102.0	99.8	99.4	77.9	98.1	83.8	151.7	163.2	445.1	113.6	102.5	81.7
45–49	105.3	107.2	82.8	86.2	120.4	116.7	111.5	89.1	110.0	94.8	150.4	158.3	365.4	133.9	124.0	96.8
50–54	130.1	132.2	103.1	106.8	146.0	142.2	141.6	118.0	145.4	119.6	178.8	171.7	330.7	174.2	162.7	134.9
55–59	164.5	170.5	133.3	139.0	187.1	177.6	193.1	148.1	188.0	157.8	226.0	208.0	360.4	246.6	241.1	176.8
60–64	221.1	223.3	186.5	196.2	255.5	236.0	257.8	206.3	289.8	239.4	292.4	259.6	406.2	318.9	308.4	242.7
65–69	302.5	315.9	241.0	274.9	402.7	385.3	431.3	338.6	456.4	375.3	445.4	389.7	558.9	497.7	524.2	373.9
70 and over	806.1	814.6	677.3	701.4	1,156.8	1,078.9	1,125.5	809.9	1,212.3	945.7	1,016.4	801.8	1,054.3	1,244.0	1,359.2	920.2

	Excess[3] death rate per 100,000															
All ages	+18.0	+22.7	....	....	+44.0	+40.0	+25.5	....	+36.7	+15.7	+90.5	+85.9	+441.9	+30.3	+27.5	....
Under 5	−.5	+14.1	....	....	+82.0	+81.7	+53.1	....	+72.7	+52.1	+172.2	+72.7	+558.7	+5.2	−8.8	....
5–9	−.1	+3.7	....	....	+8.9	+9.3	+3.1	....	+6.1	+4.3	+27.9	+41.2	+161.3	+2.1	+.3	....
10–14	+.4	+4.5	....	....	+5.0	+7.9	+2.8	....	+6.1	+3.6	+22.6	+41.9	+145.2	+3.5	+2.2	....
15–19	+4.7	+11.3	....	....	+11.2	+14.4	+3.3	....	+12.4	+5.1	+54.3	+93.0	+366.1	+8.0	+6.1	....
20–24	+4.9	+10.7	....	....	+15.5	+15.8	+.6	....	+11.2	+2.3	+81.9	+129.8	+737.0	+13.4	+10.2	....
25–29	+8.7	+14.5	....	....	+17.2	+15.4	+6.3	....	+13.0	+7.2	+132.0	+191.3	+984.3	+14.6	+9.9	....
30–34	+10.3	+12.9	....	....	+21.7	+20.1	+10.2	....	+18.0	+12.2	+150.2	+191.2	+900.6	+21.7	+11.2	....
35–39	+13.3	+19.8	....	....	+30.3	+30.3	+13.3	....	+20.4	+10.7	+116.1	+134.3	+586.3	+26.7	+16.2	....
40–44	+15.9	+20.7	....	....	+32.8	+30.6	+21.5	....	+20.2	+5.9	+73.8	+81.5	+363.4	+31.9	+20.8	....
45–49	+22.5	+24.4	....	....	+34.2	+30.5	+22.4	....	+20.9	+5.7	+61.3	+61.5	+268.6	+37.1	+27.2	....
50–54	+27.0	+29.1	....	....	+39.2	+35.4	+23.6	....	+27.4	+1.6	+60.8	+36.8	+195.8	+39.3	+27.8	....
55–59	+31.2	+37.2	....	....	+48.1	+38.6	+45.0	....	+39.9	+9.7	+77.9	+31.2	+183.6	+69.8	+64.3	....
60–64	+34.6	+36.8	....	....	+59.3	+39.8	+51.5	....	+83.5	+33.1	+86.1	+16.9	+163.5	+76.2	+65.7	....
65–69	+61.5	+74.9	....	....	+127.8	+110.4	+92.7	....	+117.8	+36.7	+106.8	+15.8	+185.0	+123.8	+150.3	....
70 and over	+128.8	+137.3	....	....	+455.4	+372.5	+315.6	....	+402.4	+135.8	+206.5	−118.4	+134.1	+323.8	+439.0	....

[1] In 1928 and later years the relatively few deaths from capillary bronchitis (less than 0.3 percent of all pneumonia) are included with pneumonia; prior to that time they are excluded. Pneumonia of all forms is included for all years.

[2] Populations for specific ages for 1928 and later years were taken from Vital Statistics Rates, 1900–40 (*12*); 10-year age groups in that volume were broken into 5-year groups in proportion to the 1930 census for 1928, 1929, and 1930, and in proportion to the 1940 census for 1934, 1936, and 1937.

Populations for 1920 through 1926 were taken from the annual mortality reports of the U. S. Census Bureau which included estimates by age for the registration States of 1920.

Populations for specific ages for 1919 and earlier years were estimated by distributing the total registration area populations according to the relative age distribution of the population of the registration States of 1920. For 1918 a correction was made in the 4 age groups from 15 to 35 years for men then in the Army, because the deaths as published by the Census Bureau excluded deaths of soldiers. Data published by Sydenstricker and King (*18*) were used in making this correction.

Computations for 1926 and earlier years were made prior to the publication of Vital Statistics Rates, 1900–40 (*12*), but a check of these rates in 5-year age groups with rates in 10-year groups shown in that volume indicates substantial agreement in every year.

[3] Excess rates for 1919 and earlier years are deviations from those for corresponding ages for the calendar year 1914; for 1920 through 1926 they are deviations from rates for 1924; for 1928 and 1929 they are deviations from rates for 1930; and for 1936 and 1937 they are deviations from rates for 1934.

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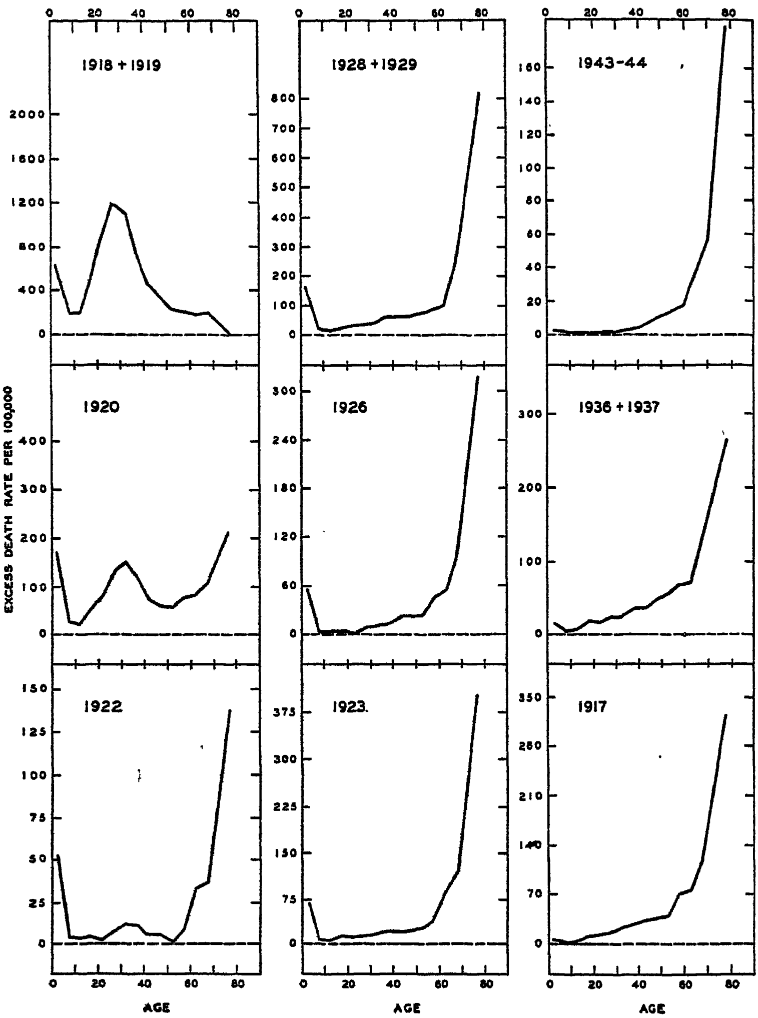

FIGURE 8.—Comparison on an arithmetic chart of the age curves of excess mortality from influenza and pneumonia in the United States during certain calendar years when influenza was epidemic, 1917–44. (Excess rates are deviations from rates for corresponding ages in a nearby "normal" year; see figure 7 for years used as "normal." In the 1943–44 epidemic, excess is over corresponding ages of same 2 months of 1942–43; age groups are as in table 2, except that the last point is an estimate for age 70+, to correspond to other curves in this chart. Scales are arranged so the average of the excess rates in the different age groups equals the same distance on the vertical scale as 20 years on the horizontal scale. In averaging, 10-year age groups are weighted by 2 and 5-year groups by 1.)

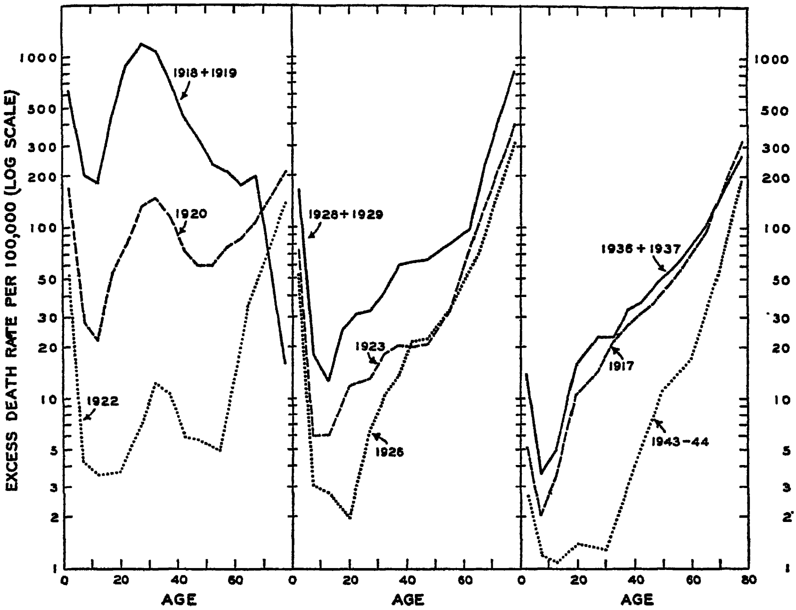

FIGURE 9.—Comparison on a semilogarithmic chart of the age curves of excess mortality from influenza and pneumonia in the United States during certain calendar years when influenza was epidemic, 1917–44. (See fig. 7 for years used as "normal" and fig. 8 for details about 1943–44 epidemic. Curves for 1917, 1922, 1923, 1926, and 1936–37 are plotted in age groups 15–24, 50–59, and 60–69 years.)

In terms of actual excess rates, the age curves of 1918–19 and 1920 are rather different but in terms of percentage excess the two epidemics have very similar curves, with one important peak at 25 to 29 years and with the smallest percentage excesses in the youngest and oldest ages. The curves for 1922, 1923, and 1928–29 each have peaks between 10 and 20 years and between 30 and 40 years, with some rise in the older ages. Aside from similarities between the 1917 and 1936–37 curves, there are few other common features in the relative age curves for the several epidemics.

The curves in figures 8, 9, and 10 represent all sizeable influenza epidemics since 1910 except the outbreaks of 1915–16, early 1931, and 1932–33. These latter epidemics show up in the data for the groups of cities (figs. 1 and 2) but do not appear to increase greatly the rates from influenza and pneumonia in the registration States for the calendar years involved. The other epidemics not represented in these charts of age curves were very small in terms of excess mortality and no attempt has been made to apply this rough calendar year method to them.

Massachusetts, 1887–1910.—Influenza occurred in pandemic form in 1889–92. About the only available influenza and pneumonia mortality records for any part of the United States for this period are those for Massachusetts which were shown as monthly excess rates in figure 3.

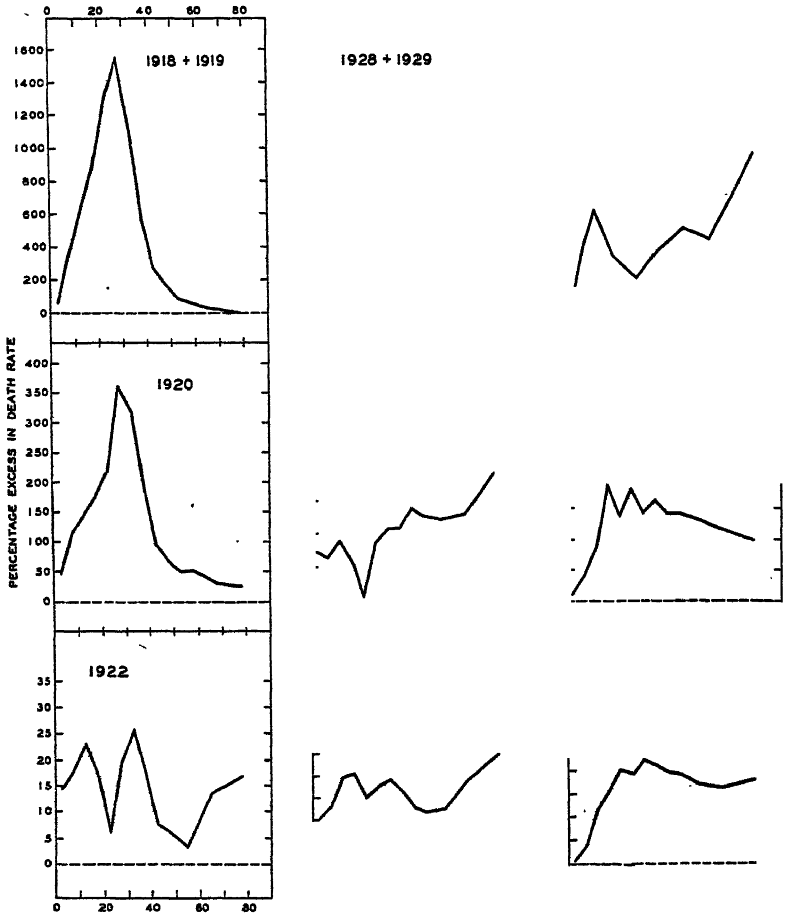

FIGURE 10.—Comparison on an arithmetic chart of the age curves of the percentage excess in mortality from influenza and pneumonia in the United States during certain calendar years when influenza was epidemic, 1917–44. (See figs. 7 and 8 for periods used as "normal." Scales are arranged so the average of the percentage excesses in the different age groups equals the same distance on the vertical scale as 30 years on the horizontal scale. Actual percentage excesses are not comparable from epidemic to epidemic because some represent percentages over a 2-year norm, others over a 1-year norm, and 1943–44 over a 2-month norm. Curves for 1917, 1922, 1923, 1926, and 1936–37 are plotted in age groups 50–59 and 60–69 years.)

Although the epidemic of early 1890 seemed to be less severe in Massachusetts than in other parts of the world, there was a series of outbreaks in the following decade. The age curves of excess mortality from influenza and pneumonia were computed for these outbreaks by the calendar year method described in a preceding section. The data are shown in table 5, and in figure 11 the actual rates are plotted on logarithmic vertical scales for calendar years which include epidemics and for nearby calendar years which were relatively free from outbreaks. The periods used as "normal" were the 3 years 1887–89 combined, and 1898, 1902, and 1904 combined. For the larger

epidemics of early 1890, winter of 1891–92, and spring of 1900, the excesses over rates for the same age groups in the "normal" periods are shown in figure 12.

Considering the excess death rates in figure 12 and also those for other years in table 5, there is no instance of any outstanding young adult peak such as occurred in the 1918–19 and 1920 epidemics in the registration area. The Massachusetts excess curves for 1891–92 and 1900 are generally similar to those previously presented for the United States for 1923, 1926, and 1928–29 (fig. 8), with excess rates for children under 5 years of age that are greater than those for young adults but far below those for older people. The curve for 1890 has few of the characteristics of those for the epidemics of 1918–19 and 1920; however the excesses in the age groups 20 to 40 years are relatively greater than those in the 1891–92 and 1900 outbreaks in the same State, and the excess among persons above 70 years of age is relatively less.

TABLE 5.—*Influenza and pneumonia mortality among persons of specific ages in certain calendar years, and the excess over rates for corresponding ages during calendar years without excessive mortality from these diseases.*

MASSACHUSETTS

Age	1898, 1902, 1904	1900	1899	1895	1893	1892	1891	1890	1887, 1888, 1889
	Annual death rate per 100,000								
All ages	169.4	214.3	208.0	203.2	240.9	255.0	213.0	198.8	165.9
Under 5	551.8	629.2	618.3	639.3	657.4	616.2	526.1	563.9	521.9
5–9	34.8	44.1	46.2	44.5	64.6	52.1	47.4	43.0	52.1
10–14	17.3	18.7	20.5	16.6	26.1	18.3	28.4	20.8	23.7
15–19	30.8	33.2	35.6	35.2	60.2	41.2	45.4	61.5	48.2
20–29	42.4	54.4	53.2	59.0	78.9	76.7	61.4	81.2	56.7
30–39	77.8	93.5	91.4	113.0	141.8	124.6	119.1	111.5	90.6
40–49	114.8	137.2	139.7	170.4	225.8	202.7	166.4	180.9	131.5
50–59	211.1	280.8	248.2	238.8	332.4	372.5	283.1	285.7	209.9
60–69	409.9	622.7	500.0	476.0	620.4	717.1	585.2	466.8	391.7
70 and over	1,068.9	1,553.9	1,496.8	1,326.4	1,367.2	1,943.3	1,560.2	1,050.5	896.0
	Excess [1] death rate per 100,000								
All ages	-------	+44.9	+33.6	+37.3	+75.0	+89.1	+47.1	+32.9	------
Under 5	-------	+77.4	+66.5	+117.4	+135.5	+94.3	+4.2	+42.0	------
5–9	-------	+9.3	+11.4	−7.6	+12.5	0	−4.7	−9.1	------
10–14	-------	+1.4	+3.2	−7.1	+2.4	−5.4	+4.7	−2.9	------
15–19	-------	+2.4	+4.8	−13.0	+12.0	−7.0	−2.8	+13.3	------
20–29	-------	+12.0	+10.8	+2.3	+22.2	+20.0	+4.7	+24.5	------
30–39	-------	+15.7	+13.6	+22.4	+51.2	+34.0	+28.5	+20.9	------
40–49	-------	+22.4	+24.9	+38.9	+94.3	+71.2	+34.9	+49.4	------
50–59	-------	+69.7	+37.1	+28.9	+122.5	+162.6	+73.2	+75.8	------
60–69	-------	+212.8	+90.1	+84.3	+228.7	+325.4	+193.5	+75.1	------
70 and over	-------	+485.0	+427.9	+430.4	+471.2	+1,047.3	+664.2	+154.5	------

[1] For 1895 and earlier years, excess rates are deviations from average annual rates for corresponding age groups for the 3 calendar years 1887–89; for 1899 and later years excess rates are deviations from average annual rates for corresponding age groups for the 3 calendar years 1898, 1902, and 1904, except for the age group under 5 years which is for the 2 years 1898 and 1904, because the rate for that age group appeared to be excessively high in 1902 although taken as a whole the year was without high rates.

Populations for specific age groups were estimated by distributing the total estimated State population according to the relative age distribution of the population of the State according to the 1890 census for 1895 and earlier years and according to the 1900 census for 1898 and later years. Data from annual reports (18).

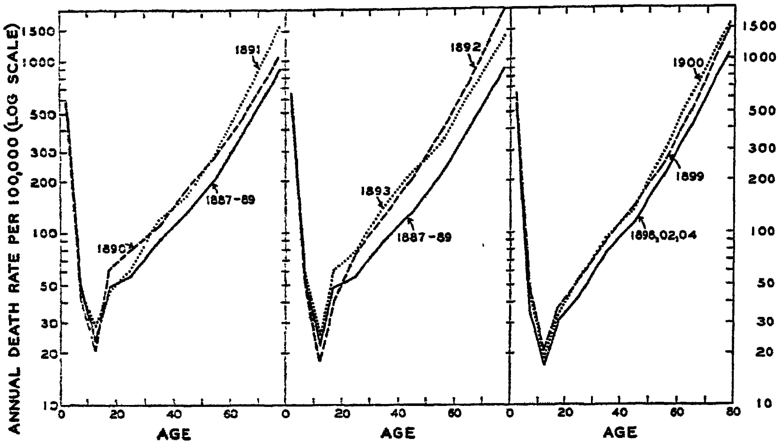

FIGURE 11.—Age-specific mortality from influenza and pneumonia in Massachusetts during certain epidemic and nonepidemic calendar years, 1887–1910. (Years 1887–89 and 1898, 1902, 1904 are used as "normal.")

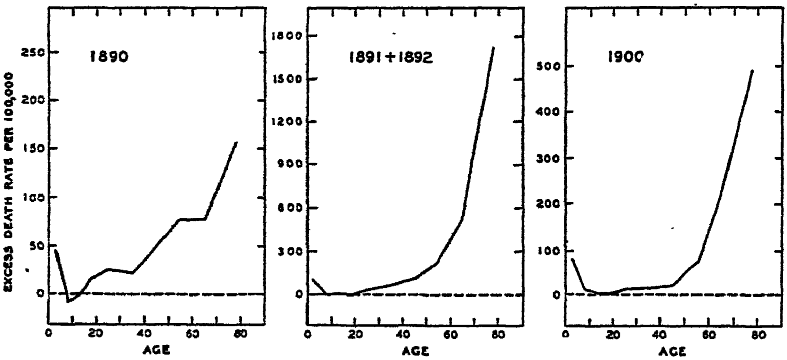

FIGURE 12.—Comparison on an arithmetic chart of the age curves of excess mortality from influenza and pneumonia in Massachusetts during certain calendar years when influenza was epidemic, 1887–1910. (Excess rates for 1890–92 are deviations from mean annual rates for corresponding age groups for 1887–89; for 1900 they are deviations from mean annual rates for corresponding age groups for the years 1898, 1902, and 1904 combined. Scales are arranged as in fig. 8 to put curves on a relative basis.)

SUMMARY

The recent 1943–44 epidemic of influenza was small as judged by excess deaths credited by attending physicians to influenza and pneumonia, but was considerably larger when measured by total excess mortality from all causes. In terms of age-specific rates there appears to be no indication of any young adult peak; in fact, the mortality in this outbreak seems to be more concentrated in the older ages than was true in recent preceding epidemics (figs. 5, 8, and 9).

An examination of the age curves of excess mortality from influenza and pneumonia in the more extensive epidemics since the pandemic of 1918–19 discloses young adult peaks in 1920 and 1922 which are similar but relatively smaller than that of 1918–19. On the other hand, the young adult peaks of 1920 and particularly of 1922 are

accompanied by rates at the youngest and oldest ages that are definitely above those for young adults, in contrast to the pandemic of 1918–19 when the young adult peak was the highest. Viewing the whole set of age curves of excess mortality from influenza and pneumonia (fig. 8), there is considerable variation from epidemic to epidemic, but in all except those of 1918–22 the tendency is for the highest excess rates to occur in the oldest ages, with relative age curves of excess mortality that are not exceedingly different from the curves of the total mortality from influenza and pneumonia in the same or a nearby year (figs. 9 and 7).

Except for the epidemics of 1943–44 and 1928–29, all excess mortality data for specific ages included in this paper represent an approximation derived by subtracting rates for a nearby "normal" year from those for the calendar year which included the epidemic. For the 1928–29 epidemic the excess rates were computed by this calendar year method and also by a similar procedure based on only the 3 months of the epidemic. Comparisons indicate that the results of the two methods are reasonably similar (fig. 6).

A similar calendar year method was applied to Massachusetts mortality from influenza and pneumonia for selected years in the period 1887–1910 which included a succession of epidemics, the largest of which was comparable in size to that of 1920. None of these outbreaks showed young adult peaks like those of the years 1918–22 (figs. 11 and 12).

THE RELATIVE VALUE OF LIQUID MEDIA, GLUCOSE CYSTINE BLOOD AGAR, AND MOUSE INOCULATION IN THE TITRATION OF *PASTEURELLA TULARENSIS*[1]

By CARL L. LARSON, *Passed Assistant Surgeon, United States Public Health Service*

Francis (*1*) found no liquid medium suitable to the growth of *Pasteurella tularensis* (*B. tularense*). Tamura and Gibby (*2*) and Steinhaus, Parker, and McKee (*3*) subsequently reported upon the growth of *P. tularensis* in liquid media. The media devised by Tamura and Gibby consisted of either gelatin or casein hydrolysates or mixtures of amino acids to which certain accessory factors such as blood-cell or liver-cell extract or biotin concentrate were added. They found cystine or cysteine hydrochloride to be necessary to maintain the organism. Steinhaus media consisted of those materials ordinarily used in glucose cystine blood agar with the exception that agar was deleted and commercial hemoglobin substituted for whole blood. These liquid media leave much to be desired from the standpoint of ease in handling.

[1] From the Division of Infectious Diseases, National Institute of Health.

It is the purpose of this paper to report our experience with liquid media and to report the relative merit of modified Steinhaus media, glucose cystine blood agar, and mouse inoculation in the enumeration of *P. tularensis*.

MATERIALS AND METHODS

The strains of *P. tularensis* used had been isolated recently from patients suffering from tularemia. Strains F. G., H. S., and G. S. were isolated in this laboratory from material taken from the local lesions of cases of oculoglandular or ulceroglandular types of tularemia and strain T. was obtained from pleural fluid of a patient with pneumonic involvement and was isolated at the laboratories of the Virginia State Department of Health. All produced typical lesions of tularemia in mice and guinea pigs, grew in a characteristic manner on glucose cystine blood agar, and gave specific serological reactions.

Glucose cystine blood agar was made according to the directions of Francis (*4*) and contained 2 percent agar, 1 percent dextrose, 0.1 percent cystine, and 10 percent rabbit blood in a base of horse infusion broth. The media was used either slanted in tubes or distributed in petri plates. The samples of Tamura and Gibby media were made with a base of hydrolyzed casein and cystine to which a red blood cell extract was added. Steinhaus media was modified simply by using his basic medium A consisting of beef heart infusion, dextrose, and cystine and adding to this 10 percent red blood cell extract instead of bacto-hemoglobin. The result was a clear fluid media which supported the growth of *P. tularensis*. All cultures were incubated at 37° C. and observed daily for 10 to 12 days before they were discarded.

Titrations for the enumeration of organisms were made in liquid media, glucose cystine blood agar, and by mouse inoculations employing 0.1 cc. or 0.3 cc. of serial tenfold dilutions of various test materials. Animal tissues or suspensions of organisms were diluted in 0.85-percent salt solution and serial tenfold dilutions were made to an end point of 10^{-10} or 10^{-12}.

Swiss mice bred at the National Institute of Health were employed. Mice of varying ages and weights were used and appeared to be uniformly susceptible to tularemia. Mice were observed for 2 weeks after injections.

EXPERIMENTAL

Growth of P. tularensis *on liquid media.*—The relative merit of the two types of liquid media for the detection of *P. tularensis* was determined. Sufficient growth from a 24-hour-old culture of *P. tularensis* (strain G. S.) was taken from the surface of a glucose cystine blood agar slant to produce a density corresponding to T-500 (Fuller's earth scale) when suspended in 10 cc. of salt solution. This was considered

to be 10^{-0} and serial tenfold dilutions in 0.85-percent salt solution were made from this suspension. Duplicate tubes of both types of liquid media were then inoculated with 0.1-cc. quantities of the various dilutions of organisms from 10^{-2} to 10^{-10}. The tubes were shaken to insure good mixture of the inoculum in the media, and incubated at 37° C. They were observed daily for 10 days. Growth was detected by the degree of turbidity which developed and by the relative number of organisms noted in smears stained by Gram's method. Organisms survived and developed in tubes of Tamura and Gibby media inoculated with a 10^{-3} dilution of culture and in tubes of modified Steinhaus media inoculated with a 10^{-6} dilution of culture. The results are shown in table 1.

TABLE 1.—*Growth of* P. tularensis *in 2 types of liquid media when 0.1 cc. of serial tenfold dilutions of a glucose cystine blood agar culture is used as an inoculum for duplicate tubes of media*

Type of medium	Dilution of inoculum	Degree of turbidity at end of—													
		First day		Second day		Third day		Fourth day		Fifth day		Seventh day		Tenth day	
Tamura and Gibby [1]	10^{-2}	3+	3+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
Do	10^{-3}	1+	1+	1+	1+	1+	1+	1+	1+	2+	2+	2+	2+	2+	2+
Do	10^{-4}	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Modified Steinhaus [2]	10^{-2}	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+	4+
Do	10^{-3}	2+	2+	3+	3+	3+	4+	4+	4+	4+	4+	4+	4+	4+	4+
Do	10^{-4}	1+	1+	2+	3+	3+	3+	3+	4+	3+	4+	3+	4+	3+	4+
Do	10^{-5}	0	0	0	1+	0	2+	2+	3+	3+	3+	3+	3+	3+	3+
Do	10^{-6}	0	0	0	0	0	1+	0	2+	0	3+	0	3+	0	3+
Do	10^{-7}	0	0	0	0	0	0	0	0	0	0	0	0	0	0

[1] Tamura and Gibby negative from 10^{-4} to 10^{-10}.
[2] Modified Steinhaus negative from 10^{-7} to 10^{-10}.

The ability of *P. tularensis* to survive and proliferate in modified Steinhaus medium through 22 consecutive passages over a course of 60 days was demonstrated. The basic media was adjusted to pH 7.8, 7.6, 7.4, 7.2, and 7.0 before autoclaving and before addition of red blood cell extract. After addition of the supplementary factor 4.5 cc. of completed media was placed in each tube. The initial inoculum consisted of 0.5 cc. of 10^{-3} dilution of a T-500 suspension of organisms (strain F. G.) grown on glucose cystine blood agar. With the exception of the first passage, transplants to new tubes containing 4.5 cc. of media were made every 2 to 3 days using 0.5 cc. inocula. In the first passage 6 days elapsed before transplants were made.

In order to determine the virulence of the organisms and their relative concentration after growth in liquid media titrations were made, using mice as the test animal. After incubation at 37° C. for 6 days 0.5 cc. of culture was withdrawn and diluted in 4.5 cc. of salt solution to make a 10^{-1} dilution and serial tenfold dilutions were made to a titer of 10^{-10}. Groups of mice were inoculated with 0.3-cc. quantities of the various dilutions intraperitoneally and deaths recorded.

At no time were we able to obtain growth of *P. tularensis* in media having an initial pH of 7.0 or 7.2 and thus these were not tested in mice. As shown in table 2 this strain was capable of growing at pH 7.8, 7.6, and 7.4 for periods of 56 days after having been transferred 22 times from the original culture on glucose cystine blood agar.

TABLE 2.—*Survival of* P. tularensis *after serial passage in modified Steinhaus media with pH 7.4, 7.6, and 7.8 as shown by infectivity for mice*

Passage No.	Number of days of growth in liquid media	Infective titre for mice of organisms grown in media having—		
		pH 7.8	pH 7.6	pH 7.4
1	6	10^{-7}	10^{-8}	10^{-7}
2	12	10^{-9}	10^{-7}	10^{-8}
12	33	—	10^{-5}	10^{-7}
20	55	10^{-7}	—	—
21	58	10^{-8}	—	—
22	60	10^{-7}	10^{-6}	10^{-6}

— = no titration made.

Using a similar technique, four other strains of *P. tularensis* were tested for survival after five passages in this media and were found to possess titers which indicated that proliferation had occurred.

Titration of P. tularensis *in various materials*.—Three mice which had died following injection with *P. tularensis* (strain T) were autopsied and blood, liver, and spleen obtained aseptically. The tissues from each animal and each tissue were handled separately and were made into 10-percent suspensions in salt solution. Inocula of 0.1 cc. of 10-percent blood or tissue suspensions were transferred to tubes of modified Steinhaus media containing either red blood cell or liver extract instead of bacto-hemoglobin or rubbed on the slanted surface of glucose cystine blood agar in test tubes. The tubes were then incubated at 37° C. and observed for growth. The tubes of glucose cystine blood agar were placed so the slanted surface was in a horizontal plane and was moist from the inoculum. If growth occurred in any tube the organism was isolated and studied to determine whether or not it was *P. tularensis*. No contaminating organisms were obtained. *P. tularensis* was isolated from all tissues except the spleen of mouse 3 on modified Steinhaus media but from only the spleen of mouse 1 and the blood and spleen of mouse 2 on slanted glucose cystine blood agar.

The heart blood of a mouse found moribund following intraperitoneal injection of *P. tularensis* was withdrawn aseptically and diluted in nine parts of saline. This was considered to be a 10^{-1} dilution of blood and further serial tenfold dilutions were made to an end point of 10^{-10}. Inocula of 0.1 cc. were given to lots of six mice each intraperitoneally and cultured on modified Steinhaus media

(pH 7.6) and on petri plates containing glucose cystine blood agar. The organisms were detected to a titre of 10^{-7} in mice, 10^{-6} on glucose cystine blood agar plates, and 10^{-4} in modified Steinhaus media.

The liver and spleen were removed from two mice previously infected with *P. tularensis*. One of those (No. 1) was moribund, while the other was fairly active although obviously ill. Ten-percent suspensions of each organ were made in 0.85 percent saline and serial tenfold dilutions of each sample of tissue were injected intraperitoneally into groups of six mice each, into tubes of modified Steinhaus media, and petri plates of glucose cystine blood agar. The media were incubated at 37° C. The results are shown in table 3.

TABLE 3.—*The relative sensitivity of mice, glucose cystine blood agar plates (Gcba), and modified Steinhaus media (Stein.) in the enumeration of* P. tularensis *in tissues of infected mice*

Mouse No.	Tissue	End point in—		
		Mice	Stein.	Gcba
1 (moribund)	Spleen	10^{-8}	[1]	10^{-8}
	Liver	10^{-8}	[1]	10^{-7}
2 (ill)	Spleen	10^{-8}	10^{-3}	10^{-7}
	Liver	10^{-8}	10^{-2}	10^{-8}

[1] Contaminated.

The technique adopted in the above experiment was used to study the comparative value of mouse inoculation, modified Steinhaus media, and petri plates containing glucose cystine blood agar in detecting the presence of organisms in varying dilutions of cultures of *P. tularensis* (strains H. S. and G. S.). The T-500 suspensions of each of these organisms in salt solution were considered to be a 10^{-0} suspension. Serial tenfold dilutions to a titre of 10^{-12} were made and 0.3 cc. of each dilution of each strain given to mice or cultured on liquid or solid media. Strain H. S. titred to 10^{-9} in mice and on solid media, and to 10^{-3} on liquid media and strain G. S. had end points of 10^{-10} in mice, 10^{-9} on solid media, and 10^{-2} on liquid media.

TABLE 4.—*The relative sensitivity of mice, glucose cystine blood agar plates (Gcba), and modified Steinhaus media (Stein.) in the enumeration of* P. tularensis *grown on the former media.*

Source of culture	End point in—		
	Mice	Stein.	Gcba
H. S.	10^{-9}	10^{-3}	10^{-9}
G. S.	10^{-10}	10^{-2}	10^{-9}

The spleens of two mice dead of tularemia were removed, ground in a mortar, and each suspended in 5.0 cc. of salt solution. Tenfold dilutions were made from each suspension to an end point of 10^{-12}. Duplicate tubes of slanted glucose cystine blood agar and plates of

the same media were inoculated with 0.3 cc. of material from the various dilutions of tissue suspension. Groups of six mice each were inoculated intraperitoneally with similar amounts of the same material. The tubes were incubated in an upright position. The water of condensation and the fluid added with the inoculum drained to the angle between the butt and the slant and as it evaporated colonies of organisms grew on the slant at the junction of the air and fluid. Spleen suspension from one mouse had an end point of 10^{-10} when inoculated into mice or cultured on glucose cystine agar plates and 10^{-8} when cultured on the slanted surface of the same media. The spleen emulsion of the other mouse had end points of 10^{-10}, 10^{-9}, and 10^{-9}, respectively, by the three methods.

DISCUSSION

The results obtained from this study substantiate the claims that glucose cystine blood agar is still the medium of choice for the cultivation of *P. tularensis.* The results which have been obtained indicate that liquid media are not as efficient as solid media for growing or detecting this organism.

Francis' medium is capable of supporting proliferation of small numbers of organisms and in our experience has been almost as sensitive as mouse inoculation when used as a method of enumerating the number of virulent recently isolated organisms in a given sample of material.

CONCLUSIONS

P. tularensis grows for at least 22 passages during a period of 60 days in liquid medium without loss of virulence for white Swiss mice.

Glucose cystine blood agar is still the artificial medium of choice for routine cultivation of *P. tularensis.*

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USE OF LAWSON'S BEAN MEDIUM FOR LABORATORY DETECTION OF *MYCOBACTERIUM TUBERCULOSIS* IN SPUTUM

By FLORENCE L. EVANS, Ph. D., *State Board of Health Laboratory, Jefferson City, Mo.*

A comparatively simple medium for the cultivation of *Mycobacterium tuberculosis* has been described by Lawson (*1*). Essentially, it consists of the pulp of cooked mashed beans mixed with water, the juice in

which the beans had been cooked, agar, glycerine, and any suitable dye. The medium must be poured aseptically and solidified immediately by chilling in chipped ice or ice water.[1]

The author is not aware of any report on the use of this medium in routine work. For this reason, a series of cultures was made using the bean medium, prepared from dried lima beans, parallel with Petragnanni's medium and stained smears. The Petragnanni medium was modified by doubling the number of egg yolks, as suggested by Perry and Petran (*2*).

The specimens used consisted of 1,009 consecutive samples of sputum received at the Division of Laboratories of the State Board of Health at Jefferson City, Mo., and examined by the author. The regular concentration procedure, which consisted of sodium hydroxide digestion, centrifuging, neutralization with hydrochloric acid, and again centrifuging, was followed. Three portions of the sediment obtained from each specimen were used: (1) for the preparation of smears, (2) for the inoculation of a slant of Lawson's bean agar, and (3) the inoculation of a slant of modified Petragnanni's medium. The smears were stained with Ziehl-Neelsen's stain for microscopic examination. Screw-cap culture tubes were used and the two cultures were incubated side by side at 37° C. They were examined at the end of 4 to 6 weeks, and again at the end of 3 months. The dye used in the bean agar was Malachite green and the concentration was one-tenth that used in Petragnanni's medium. The same dye was used in both media in order to make the comparison as close as possible. The concentration of Malachite green used in Petragnanni's medium was much too inhibitory in the bean medium. Less than one-tenth this amount was found insufficient to prevent the growth of nonacid-fast organisms.

There were 186 specimens, or 18.4 percent out of the 1,009 in which *Mycobacteria* were demonstrated by one or more of the methods. The correlation is shown in table 1.

It can be seen that the most efficient method was the modified Petragnanni's culture, which picked up a total of 165, or 88.7 percent, and missed 21, or 11.3 percent, of those found positive. It is also to be noted that 27, or 14.5 percent, of the specimens were found positive only by this method. Next in efficiency was the stained-smear method which detected 136, or 73.1 percent, of the total and missed 50, or 26.9 percent. Fifteen, or 8.1 percent, were found only

[1] 1. 200 gm. dried legumes; soak in 700 cc. of water for 24 hours.
2. Change water and autoclave at 15 pounds for 25 minutes.
3. Drain beans and mash through a fine sieve.
4. 105 gm. of pureed beans are weighed and mixed with 30 cc. of juice which was drained from beans, and 180 cc. of distilled water in a 500-cc. flask.
5. Add 3 gm. granulated agar.
6. Autoclave at 15 pounds for 20 minutes.
7. Add immediately 7 cc. of glycerine and appropriate dye.
8. Cool to 50° to 60° and pour aseptically into chilled tubes. Solidify at once in ice bath.

TABLE 1

Method	Total		*Mycobacterium* found: On Petragnanni's medium		On smear		On bean		*Mycobacterium* missed: On bean		On smear		On Petragnanni's medium	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Smear+ Bean+ Petragnanni's+	98	52.7	98	...	98	...	98	...	...	...	...	...	...	...
Smear− Bean+ Petragnanni's+	19	10.2	19	...	...	...	19	...	...	...	19	...	...	...
Smear+ Bean− Petragnanni's+	21	11.3	21	...	21	...	...	...	21	...	...	...	...	...
Smear+ Bean+ Petragnanni's−	2	1.1	...	...	2	...	2	...	...	...	...	...	2	...
Smear− Bean− Petragnanni's+	27	14.5	27	...	...	...	...	...	27	...	27	...	...	...
Smear− Bean+ Petragnanni's−	4	2.1	...	...	...	...	4	...	...	...	4	...	4	...
Smear+ Bean− Petragnanni's−	15	8.1	...	...	15	...	...	...	15	...	...	...	15	...
Total	186	100.0	165	88.7	136	73.1	123	66.2	63	33.8	50	26.9	21	11.3

on smears. The Lawson's bean medium cultures were the least efficient. A total of 123, or 66.2 percent, were positive by this method and 63, or 33.8 percent were missed. Only 4, or 2.1 percent, were positive by this method alone.

Lawson's bean agar has several advantages which might make it useful under certain circumstances, although it appears to be less efficient than either modified Petragnanni's medium or stained smears. Most important is the cheapness and availability of the ingredients, second is the comparative ease with which it can be prepared. While it is not the best medium, it is, nevertheless, a good medium for the cultivation of the tubercle bacillus. If the bean medium and stained smears are compared without the modified Petragnanni's, it is seen that 23 specimens were positive on bean medium and not on smear, and 36 were positive on smear and not on bean culture. These findings suggest that the positive specimens found in addition to those discovered by stained smears may be enough to warrant use of the bean medium, if Petragnanni's medium is not available.

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(1) Lawson, George B.: Growth of Tubercle Bacilli on Various Media, With Special Reference to Legumes. Hammond's Printing & Lithographing Works, Roanoke, Va., Dec. 7, 1936.
(2) Perry, C. A., and Petran, E.: State of Maryland Department of Health (personal communication), 1939.

DEATHS DURING WEEK ENDED JUNE 30, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 30, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,747	8,476
Average for 3 prior years	8,558	
Total deaths, first 26 weeks of year	243,311	247,446
Deaths under 1 year of age	562	599
Average for 3 prior years	608	
Deaths under 1 year of age, first 26 weeks of year	15,909	16,251
Data from industrial insurance companies:		
Policies in force	67,377,490	66,644,754
Number of death claims	14,291	11,456
Death claims per 1,000 policies in force, annual rate	11.1	9.0
Death claims per 1,000 policies, first 26 weeks of year, annual rate	10.9	10.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 7, 1945

Summary

For the current week, the incidence of poliomyelitis for the country as a whole remained practically unchanged. A total of 154 cases was reported, as compared with 155 last week, 288 for the corresponding week last year, and a 5-year (1940–44) median of 86. Of the current total, 95 cases occurred in the 6 States which reported 7 or more cases each, only one of which (Texas), showed a decline. These States are as follows (last week's figures in parentheses): Connecticut 7 (1), New York 21 (16), New Jersey 10 (5), Tennessee 18 (6), Texas 21 (54), California 18 (12).

The total reported cases to date is 1,424, as compared with 1,290 and 1,329 for the corresponding periods of 1944 and 1943. For the 11-week period ended March 17, the date of lowest weekly incidence this year, 397 cases were reported, as compared with 263 and 302, respectively, for the corresponding periods of 1944 and 1943. Since that date, 1,027 cases have been reported, the same number as for the corresponding 16-week period of each of the two preceding years.

The downward trend in the incidence of meningococcus meningitis, interrupted last week, was resumed. A total of 109 cases was reported, as compared with 143 last week, 122 for the next earlier week, and a 5-year median of 61. The total for the year to date is 5,527, as compared with 12,027 for the corresponding period last year and a 5-year median of 2,082.

The current incidence of diphtheria, influenza, measles, scarlet fever, typhoid fever, and whooping cough declined during the week. Total numbers of cases reported to date for certain other diseases are as follows (last year's corresponding figures in parentheses): Anthrax 19 (23), dysentery, all forms, 16,639 (13,703), infectious encephalitis 184 (297), leprosy 25 (15), Rocky Mountain spotted fever 169 (205), tularemia 423 (315), endemic typhus fever 1,698 (1,502).

A total of 8,536 deaths was recorded in 90 large cities of the United States, as compared with 8,669 last week, a 3-year (1942–44) average of 7,761, and 7,777 for the corresponding week of last year. The total to date is 249,558, as compared with 253,098 for the corresponding period of last year.

Telegraphic morbidity reports from State health officers for the week ended July 7, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria, Week ended— July 7, 1945	Diphtheria, Week ended— July 8, 1944	Diphtheria, Median 1940–44	Influenza, Week ended— July 7, 1945	Influenza, Week ended— July 8, 1944	Influenza, Median 1940–44	Measles, Week ended— July 7, 1945	Measles, Week ended— July 8, 1944	Measles, Median 1940–44	Meningitis, meningococcus, Week ended— July 7, 1945	Meningitis, meningococcus, Week ended— July 8, 1944	Meningitis, meningococcus, Median 1940–44
NEW ENGLAND												
Maine	0	0	0	------	------	------	3	32	38	0	1	1
New Hampshire	0	0	0	------	------	------	0	31	11	0	0	0
Vermont	0	0	0	------	------	------	23	10	61	0	0	0
Massachusetts	5	2	0	------	------	------	250	347	480	4	5	5
Rhode Island	2	1	0	22	6	------	0	13	50	0	0	0
Connecticut	1	0	1	------	------	------	34	66	124	2	1	1
MIDDLE ATLANTIC												
New York	9	2	8	[1] 4	[1] 1	[1] 1	72	328	605	10	18	10
New Jersey	1	1	1	------	------	1	61	262	285	2	11	3
Pennsylvania	2	5	6	1	------	------	261	133	226	7	21	4
EAST NORTH CENTRAL												
Ohio	4	6	3	6	3	4	24	68	68	7	0	1
Indiana	4	4	2	6	1	2	14	14	22	6	2	0
Illinois	2	4	8	3	13	5	246	72	150	11	8	1
Michigan [2]	7	3	2	------	1	1	50	296	296	4	8	2
Wisconsin	1	2	0	9	2	7	69	461	643	1	5	1
WEST NORTH CENTRAL												
Minnesota	6	3	3	------	------	1	7	72	72	1	1	0
Iowa	1	3	1	------	------	1	34	16	68	0	1	0
Missouri	0	4	1	4	------	------	15	19	38	3	8	2
North Dakota	0	0	0	------	1	1	2	7	7	0	1	1
South Dakota	2	2	2	------	------	------	15	3	5	1	0	0
Nebraska	1	2	1	3	------	------	4	23	23	0	1	1
Kansas	2	3	3	------	------	2	11	51	60	1	2	1
SOUTH ATLANTIC												
Delaware	1	0	0	------	------	------	1	3	3	0	1	1
Maryland [2]	4	4	3	2	3	2	8	59	59	1	12	6
District of Columbia	0	0	1	------	1	------	1	28	28	3	2	1
Virginia	0	0	3	89	37	32	11	82	82	7	6	1
West Virginia	1	3	3	------	1	1	2	53	9	1	1	1
North Carolina	5	4	3	------	------	------	5	99	43	6	1	1
South Carolina	6	2	2	52	100	100	11	31	38	1	4	1
Georgia	5	2	2	2	5	5	5	35	35	0	1	1
Florida	2	3	1	------	5	5	8	34	13	0	1	1
EAST SOUTH CENTRAL												
Kentucky	3	1	1	------	4	1	18	28	28	1	3	2
Tennessee	4	7	3	15	16	12	19	25	25	3	5	2
Alabama	0	4	2	------	15	8	0	9	27	0	5	1
Mississippi [2]	3	7	7	------	------	------	------	------	------	3	2	1
WEST SOUTH CENTRAL												
Arkansas	5	1	2	3	11	6	11	24	21	1	0	0
Louisiana	4	0	1	------	------	1	14	19	15	1	2	1
Oklahoma	1	0	3	6	1	5	14	31	27	1	4	3
Texas	26	23	16	298	236	236	146	277	145	4	7	4
MOUNTAIN												
Montana	0	1	1	5	------	------	3	8	31	0	1	1
Idaho	2	0	0	------	4	1	12	17	7	0	0	0
Wyoming	0	0	0	------	------	------	1	9	12	0	0	0
Colorado	4	5	5	10	------	11	9	20	32	0	1	0
New Mexico	0	2	2	------	------	------	3	4	4	0	0	0
Arizona	7	3	1	19	22	22	8	19	20	0	1	0
Utah [2]	1	0	0	------	------	------	78	30	70	0	0	0
Nevada	0	0	0	------	1	------	1	42	3	0	0	0
PACIFIC												
Washington	8	1	3	------	------	------	134	121	93	1	1	0
Oregon	3	3	2	1	1	1	54	27	46	2	1	0
California	13	15	15	21	12	17	477	841	366	13	32	2
Total	158	138	138	581	503	503	2,249	4,299	4,763	109	188	61
27 weeks	6,896	5,716	6,487	67,055	336,026	166,984	93,473	580,848	517,785	5,527	12,027	2,082

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended July 7, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44
	July 7, 1945	July 8, 1944		July 7, 1945	July 8, 1944		July 7, 1945	July 8, 1944		July 7, 1945	July 8, 1944	
NEW ENGLAND												
Maine	1	0	0	23	14	3	0	0	0	0	1	1
New Hampshire	2	0	0	1	6	2	0	0	0	0	0	0
Vermont	0	1	0	3	11	0	0	0	0	1	1	0
Massachusetts	1	0	0	93	74	69	0	0	0	3	3	3
Rhode Island	0	1	0	4	4	4	0	0	0	0	0	0
Connecticut	7	2	0	8	19	19	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	21	34	3	135	111	111	0	0	0	3	6	6
New Jersey	10	2	1	25	33	33	0	0	0	0	1	2
Pennsylvania	0	26	2	87	88	76	0	0	0	4	0	6
EAST NORTH CENTRAL												
Ohio	5	7	3	96	258	105	0	2	0	4	7	7
Indiana	0	6	2	22	20	12	0	0	0	0	2	2
Illinois	2	6	5	74	44	57	0	0	3	1	2	4
Michigan [2]	3	1	0	76	80	67	0	2	0	4	1	3
Wisconsin	0	1	0	52	46	47	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota	0	2	2	16	44	21	0	0	0	1	0	0
Iowa	2	2	1	8	9	10	1	0	0	0	1	1
Missouri	1	1	0	11	12	12	0	0	0	0	1	5
North Dakota	1	1	0	7	5	4	0	0	0	0	1	0
South Dakota	0	0	0	5	14	4	0	0	0	1	0	0
Nebraska	0	1	0	29	5	7	0	0	0	0	0	0
Kansas	1	2	2	18	15	15	0	0	0	2	2	2
SOUTH ATLANTIC												
Delaware	1	0	0	1	2	2	0	0	0	0	0	0
Maryland [2]	3	0	0	25	37	18	0	0	0	0	4	2
District of Columbia	0	0	0	10	2	9	0	0	0	0	0	0
Virginia	5	14	1	17	18	10	0	0	0	4	1	4
West Virginia	2	0	0	9	19	12	0	1	0	3	4	5
North Carolina	1	92	1	12	11	11	0	0	0	6	3	4
South Carolina	6	4	0	5	2	2	0	0	0	11	9	6
Georgia	5	4	4	5	6	8	0	0	0	5	11	17
Florida	0	7	2	1	2	2	0	0	0	4	5	5
EAST SOUTH CENTRAL												
Kentucky	1	28	2	7	6	8	0	0	0	6	7	9
Tennessee	18	2	2	15	12	12	0	0	0	3	7	8
Alabama	5	5	4	5	5	5	1	0	0	5	4	5
Mississippi [2]	1	2	2	4	2	2	0	0	0	3	6	7
WEST SOUTH CENTRAL												
Arkansas	0	1	1	3	2	2	0	0	0	3	3	8
Louisiana	3	9	0	7	5	4	0	0	0	8	8	9
Oklahoma	6	2	2	0	1	7	0	0	0	6	4	4
Texas	21	5	5	22	40	20	0	0	0	26	24	30
MOUNTAIN												
Montana	1	0	0	1	8	8	0	1	0	0	1	0
Idaho	0	2	1	2	7	4	0	0	0	0	0	0
Wyoming	0	0	0	3	3	3	0	0	0	3	0	0
Colorado	0	3	0	15	10	8	0	0	0	0	2	0
New Mexico	0	0	0	2	0	1	0	0	0	6	0	1
Arizona	0	1	0	2	14	3	0	0	0	0	0	1
Utah [2]	0	0	0	7	15	6	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	0	1	0	21	65	10	1	0	0	1	0	0
Oregon	0	2	0	2	22	9	0	0	0	0	1	1
California	18	8	8	144	161	57	0	0	0	2	5	5
Total	154	288	86	1,140	1,389	964	3	6	9	129	138	215
27 weeks	1,424	1,290	847	129,055	142,782	93,132	248	273	583	1,872	2,253	2,593

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately as follows: Massachusetts 3; South Carolina 2; Arkansas 2; Louisiana 1; Wyoming 2; California 1.

Telegraphic morbidity reports from State health officers for the week ended July 7, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended July 7, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	July 7, 1945	July 8, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	31	11	22	0	0	0	0	0	0	0	1
New Hampshire	0	0	0	0	0	0	0	0	0	0	1
Vermont	28	30	14	0	0	0	0	0	0	0	3
Massachusetts	100	48	84	0	0	0	0	0	0	0	2
Rhode Island	[3] 7	2	18	0	0	0	0	0	0	0	0
Connecticut	30	24	26	0	1	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	284	83	245	2	12	0	0	0	0	0	3
New Jersey	165	47	53	0	0	0	0	2	0	0	3
Pennsylvania	196	76	216	0	0	0	1	0	0	1	2
EAST NORTH CENTRAL											
Ohio	155	196	211	0	0	1	0	1	0	0	1
Indiana	27	20	20	0	0	0	0	0	0	0	2
Illinois	57	78	88	1	12	0	1	0	0	0	4
Michigan [3]	35	43	167	1	1	0	0	0	0	0	9
Wisconsin	75	67	103	0	0	0	0	0	0	0	4
WEST NORTH CENTRAL											
Minnesota	1	14	41	3	0	0	0	0	0	0	5
Iowa	8	10	47	0	0	0	0	0	0	0	0
Missouri	24	31	31	0	0	2	0	0	0	0	0
North Dakota	1	14	14	0	0	0	0	0	0	0	0
South Dakota	0	55	4	0	0	0	0	0	0	0	1
Nebraska	0	17	14	0	0	0	0	0	0	0	0
Kansas	36	70	70	1	0	0	0	1	0	0	1
SOUTH ATLANTIC											
Delaware	5	4	4	0	0	0	0	0	0	0	0
Maryland [3]	60	91	86	1	0	1	0	2	0	0	1
District of Columbia	12	1	9	0	0	0	0	0	0	0	0
Virginia	84	55	69	0	0	131	0	4	3	0	1
West Virginia	27	34	36	0	0	0	0	0	0	0	0
North Carolina	105	144	144	0	0	0	0	1	0	1	2
South Carolina	94	124	91	14	65	0	0	0	0	1	0
Georgia	9	22	22	1	5	5	0	1	0	31	6
Florida	4	21	10	4	0	0	1	0	0	11	0
EAST SOUTH CENTRAL											
Kentucky	48	156	61	0	1	0	0	0	2	0	2
Tennessee	23	69	54	1	0	10	1	0	4	1	1
Alabama	22	47	39	8	0	0	0	1	0	12	0
Mississippi [3]	------	------	------	0	0	0	0	0	1	0	0
WEST SOUTH CENTRAL											
Arkansas	8	11	22	0	2	0	0	0	7	1	0
Louisiana	0	1	9	0	0	0	0	0	1	7	1
Oklahoma	28	15	17	1	3	0	0	0	0	0	4
Texas	173	267	250	12	452	27	0	0	0	34	12
MOUNTAIN											
Montana	4	4	14	0	0	0	0	0	0	0	0
Idaho	5	3	5	0	0	0	0	0	0	0	0
Wyoming	0	8	8	0	0	4	0	1	0	0	0
Colorado	37	15	33	0	0	0	0	0	0	0	0
New Mexico	6	0	22	0	0	0	0	0	0	0	0
Arizona	29	17	17	0	0	27	1	0	0	0	2
Utah [3]	23	62	62	0	0	0	0	0	0	0	3
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	21	13	29	0	0	0	0	0	0	0	0
Oregon	0	5	26	0	0	0	0	2	0	0	3
California	249	47	222	0	10	0	0	0	0	0	3
Total	2,336	2,172	3,431	50	564	208	5	16	18	100	85
Same week, 1944	2,172	------	------	71	776	345	13	33	15	92	71
Average, 1942–44	3,123	------	------	42	608	396	13	[4] 18	20	[4] 65	------
27 weeks: 1945	67,428	------	------	883	12,241	3,515	184	169	423	1,698	2,510
1944	49,676	------	------	826	9,632	3,245	297	205	315	1,502	1,863
Average, 1942–44	87,134	------	[4] 102036	785	6,742	2,559	279	[4] 205	447	[4] 1,072	------

[3] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.

Anthrax: New York 1 case. *Leprosy:* California 1 case. *Psittacosis:* California 1 case. *Rabies:* Missouri 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 30, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	2	0	4	0	0	1
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	2	0	0	0
Massachusetts:												
Boston	3	0	------	0	84	4	6	0	22	0	0	32
Fall River	0	0	------	0	0	1	0	0	0	0	0	0
Springfield	0	0	------	0	2	0	0	0	4	0	0	5
Worcester	0	0	------	0	53	0	3	0	2	0	0	3
Rhode Island:												
Providence	0	0	------	0	5	1	1	0	2	0	0	24
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	2	0	0	0
Hartford	1	0	------	0	18	0	1	0	7	0	0	0
New Haven	0	0	------	0	2	0	4	0	0	0	0	12
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	1	1	7	5	6	0	0	3
New York	11	0	1	0	73	9	0	4	112	0	0	110
Rochester	0	0	2	0	50	1	3	0	3	0	0	13
Syracuse	0	0	------	0	0	0	2	0	1	0	0	61
New Jersey:												
Camden	0	0	------	0	3	0	0	0	1	0	0	0
Newark	0	0	------	0	5	1	0	0	6	0	0	11
Trenton	0	0	------	0	1	0	3	0	0	0	0	6
Pennsylvania:												
Philadelphia	0	0	------	0	301	2	16	0	28	0	2	93
Pittsburgh	0	0	------	0	3	5	8	0	13	0	0	17
Reading	1	0	------	0	0	0	0	0	1	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	3	3	5	0	7	0	0	6
Cleveland	0	0	1	0	2	4	4	2	11	0	1	37
Indiana:												
Fort Wayne	0	0	------	0	0	0	4	0	0	0	0	0
Indianapolis	0	0	------	1	3	0	2	0	8	0	0	4
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	1	0	0	0
Illinois:												
Chicago	0	0	1	1	256	8	17	2	45	0	0	48
Springfield	0	0	------	0	0	0	2	0	0	0	0	0
Michigan:												
Detroit	6	1	1	1	122	3	12	2	28	0	2	27
Flint	0	0	------	0	1	0	4	0	3	0	0	0
Grand Rapids	0	0	------	0	2	0	0	0	3	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	8	0	0	0	0	0	0	3
Milwaukee	0	0	------	0	16	2	1	1	24	0	0	9
Racine	0	0	------	0	0	0	0	0	1	0	0	8
Superior	0	0	------	0	1	0	0	0	1	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	0	1	2	0	8	0	0	1
Minneapolis	0	0	------	1	0	0	2	0	16	0	0	3
St. Paul	0	0	------	0	5	0	4	0	2	0	0	1
Missouri:												
Kansas City	0	0	------	0	8	0	1	0	5	0	0	0
St. Joseph	0	0	------	0	1	0	0	0	0	0	0	0
St. Louis	0	0	1	1	17	1	8	2	5	0	0	18
North Dakota:												
Fargo	0	0	------	0	0	0	4	0	0	0	0	0
Nebraska:												
Omaha	1	0	------	0	1	0	2	0	3	0	0	0
Kansas:												
Topeka	0	0	------	0	2	0	0	0	5	0	0	1
Wichita	0	0	------	0	2	0	5	0	3	0	0	2

City reports for week ended June 30, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	1	0	1	1	0	0	0	0
Maryland:												
Baltimore	1	0		0	3	3	3	0	14	0	0	60
Cumberland	0	1		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0		1	1	0	7	3	13	0	2	22
Virginia:												
Lynchburg	0	0		0	2	0	1	0	2	0	0	0
Richmond	0	0		0	3	1	0	1	3	0	0	4
Roanoke	0	0		0	0	1	0	0	2	0	1	0
West Virginia:												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	0	0	1	0	1	0	0	1
North Carolina:												
Raleigh	0	0		0	0	0	0	0	0	0	0	4
Wilmington	0	0		0	1	0	1	0	1	0	0	6
Winston-Salem	0	0		0	0	0	2	0	1	0	0	9
South Carolina:												
Charleston	0	0		0	1	1	0	2	0	0	0	2
Georgia:												
Atlanta	1	0		0	0	0	2	0	0	0	1	3
Brunswick	1	0		0	0	0	0	0	1	0	0	0
Savannah	0	0	1	1	0	0	2	0	0	0	0	0
Florida:												
Tampa	0	0		0	0	0	3	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	5	1	9	0	2	0	2	5
Nashville	0	0		0	1	0	1	0	0	0	0	0
Alabama:												
Birmingham	0	0		0	0	0	3	5	0	0	1	0
Mobile	0	0		0	0	3	2	0	0	0	1	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	2	0	0	0	0	0	0	0
Louisiana:												
New Orleans	1	0	2	1	3	0	4	0	1	0	0	1
Shreveport	0	0		0	0	0	3	2	0		1	0
Texas:												
Dallas	2	0		0	5	0	4	0	2	0	1	1
Galveston	0	0		0	0	0	1	3	2		0	0
Houston	1	0		1	1	0	4	9	6	0	0	0
San Antonio	0	0		0	2	1	1	0	0	0	0	8
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	0	0	0	0	0	0
Great Falls	0	0		0	1	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	1
Missoula	0	0		0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	2	1	3	0	14	0	2	0	0	11
Pueblo	0	0		0	0	0	1	0	0	0	0	4
Utah:												
Salt Lake City	0	0		0	36	0	0	0	2	0	0	4

City reports for week ended June 30, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	60	0	3	0	8	0	0	3
Spokane	1	0	------	0	7	0	0	0	2	0	0	1
Tacoma	0	0	------	0	29	0	1	0	0	0	0	2
California:												
Los Angeles	1	0	5	0	70	1	2	0	31	0	0	34
Sacramento	1	0	------	0	6	0	1	0	3	0	0	9
San Francisco	0	0	------	0	97	1	3	2	18	0	0	4
Total	36	2	17	11	1,391	60	215	46	514	0	15	763
Corresponding week, 1944	51	------	12	6	1,289	------	248	------	509	0	13	475
Average, 1940-44	59	------	28	[1] 9	[2] 2,628	------	[1] 248	------	527	0	23	1,019

[1] 3-year average, 1942-44.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York, 2; Richmond, 1.
Dysentery, bacillary.—Cases: New York, 3; Detroit, 1; Charleston, S. C., 24; Nashville, 2; Los Angeles, 2.
Dysentery, unspecified.—Cases: San Antonio, 8.
Rocky Mountain spotted fever.—Cases: Washington, 1.
Typhus fever, endemic.—Cases: Atlanta, 2; New Orleans, 2; Shreveport, 1; Dallas, 1; San Antonio, 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,058,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	0.0	0.0	431	15.8	44.6	0.0	118	0.0	0.0	202
Middle Atlantic	5.6	0.0	1.4	0.5	202	8.8	18.1	4.2	79	0.0	0.9	146
East North Central	4.4	0.6	1.9	1.9	262	12.6	32.2	4.4	84	0.0	1.9	92
West North Central	4.0	0.0	2.0	4.0	72	4.0	55.7	4.0	94	0.0	0.0	52
South Atlantic	4.9	1.6	1.6	3.3	20	9.8	37.6	11.4	64	0.0	6.5	181
East South Central	0.0	0.0	0.0	0.0	35	23.6	88.5	29.5	12	0.0	23.6	30
West South Central	11.5	0.0	5.7	5.7	37	2.9	48.8	40.2	32	0.0	5.7	29
Mountain	7.9	0.0	15.9	7.9	318	0.0	119.1	0.0	32	0.0	0.0	159
Pacific	4.7	0.0	7.9	0.0	425	3.2	15.8	3.2	98	0.0	0.0	84
Total	5.5	0.3	2.6	1.7	214	9.2	33.0	7.1	79	0.0	2.3	117

PLAGUE INFECTION IN SAN BERNARDINO AND SAN BENITO COUNTIES, CALIF.

Plague infection has been reported proved on June 27 in San Bernardino and San Benito counties, Calif., as follows.—*San Bernardino County:* In a pool of 11 fleas from mice, *Peromyscus*, sp., trapped 1 mile north of Fawnskin; in a pool of 52 fleas from 3 ground squirrels, *C. fisheri*, trapped 1 mile west and 1 mile north of Big Bear Lake. *San Benito County:* In a pool of 203 fleas from 17 ground squirrels, *C. beecheyi*, shot 7 miles east of Tres Pinos; in tissue from 5

ground squirrels, same species, shot 8 miles east and 5 miles south of Tres Pinos; in 3 pools of fleas additional to those previously reported proved on June 22, from ground squirrels, *C. beecheyi*, shot distant from Tres Pinos as follows: A pool of 400 fleas, 7 miles east and 3 miles south; 379 fleas, 7 miles east and 5 miles south; 185 fleas, 8 miles east and 5 miles south.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—May 1945.—During the month of May 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	4		3		6		2		15	
Diphtheria	5		1				3		9	
Dysentery:										
Amebic	1				3		12		16	
Bacillary			1		4				5	
Leprosy				1			2		2	1
Malaria [1]	7	1	4		62		79	1	152	2
Measles					5				5	
Mumps					5		2		7	
Paratyphoid fever							1		1	
Pneumonia		10		6	29			5	[2] 29	21
Relapsing fever							2		2	
Trachoma	1								1	
Tuberculosis		12		2	12			7	[2] 12	21
Whooping cough					5				[2] 5	

[1] 17 recurrent cases.
[2] In the Canal Zone only.

FOREIGN REPORTS

BRITISH EAST AFRICA

Kenya—Notifiable diseases—Year 1944.—During the year 1944, certain notifiable diseases were reported in Kenya, British East Africa, as follows:

Disease	Cases	Deaths
Anthrax	738	27
Diphtheria	33	4
Dysentery:		
Amebic	5,067	71
Bacillary	2,256	68
Encephalitis, infectious	22	11
Gastroenteritis	17,712	234
Hookworm disease	1,814	1
Leprosy	180	2
Malaria	77,840	397
Measles	2,576	19
Meningitis, meningococcus	1,075	303
Plague, human	9	4
Poliomyelitis	31	5
Relapsing fever	336	19
Scarlet fever	2	
Schistosomiasis	736	2
Smallpox (alastrim)	3,046	16
Syphilis	13,907	73
Trachoma	1,446	
Trypanosomiasis	236	13
Tuberculosis	3,200	504
Typhoid and paratyphoid fever	897	186
Typhus fever	57	3
Undulant fever	19	1
Yaws	8,897	5

NOTE.—Present estimated population is 3,725,000.

CANADA

Provinces—Communicable diseases—Week ended June 16, 1945.—During the week ended June 16, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	1	16		100	339	46	27	79	123	731
Diphtheria		3	3	25	2	5		1	2	41
Dysentery, bacillary				1						1
German measles		14		12	39		8	35	28	136
Influenza	7	7			34				7	55
Measles		3		75	185	31	36	51	443	824
Meningitis, meningococcus				1	5		1			7
Mumps		1		85	110	37	23	70	24	350
Poliomyelitis				1	1					2
Scarlet fever		1	14	72	90	15		22	7	221
Tuberculosis (all forms)		5	1	129	28	14	20	12	76	285
Typhoid and paratyphoid fever				4	2	1	1	2		10
Undulant fever				3						3
Venereal diseases:										
Gonorrhea		13	22	114	150	47	24	40	59	469
Syphilis	1	1	4	126	86	17	5	12	23	275
Whooping cough				72	19		4	8	5	108

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January—April 1945	May 1945	June 1945—week ended—				
				2	9	16	23	30
ASIA								
China: Szechwan Province—								
Chungking	C						[1]2,000	
Hsiao Lung Ken	C						1	
Hsin Kai Shik	C						1	
Kiang Pei	C						1	
India	C	39,466	17,107					
Bombay	C	14	23			1		
Calcutta	C	2,533	1,007	122	82	96		
Cawnpore	C	6	44	20	14	20		
Chittagong	C	13	2	1	1			
Delhi	C	[2]1	10	2	4	4		
Madras	C	47	2					
Vizagapatam	C		13					
Indochina: Cochinchina	C		P					

[1] From the beginning of the outbreak.
[2] Imported.

PLAGUE

[C indicates cases; P, present]

Place		January—April 1945	May 1945	June 1945—week ended—				
				2	9	16	23	30
AFRICA								
Algeria	C	[1]12						
Basutoland	C	4						
Bechuanaland	C	7						
Belgian Congo	C	4	2	1	1			
British East Africa:								
Kenya	C	3	1			1		[2]5
Uganda	C	4		2				
Egypt	C	67	46					
Ismailiya	C	45	22					
Port Said	C	6	14	2	7	5	7	
Suez	C	5	5		5			
French West Africa	C	5						
Dakar	C	1						
Madagascar	C	102	8					
Morocco (French)	C	121	110				[3]193	
Senegal	C	54						
Tunisia	C	3						
Union of South Africa	C	6	1					
ASIA								
China: Foochow	C					P		
India	C	17,469						
Iraq	C	34						
Palestine	C	12						
Plague-infected rats		16						
EUROPE								
France: Corsica—Ajaccio	C		2		2		1	
Great Britain: Malta	C							4
Portugal: Azores	C	3		1				
Spain: Canary Islands	C	1						

See footnotes at end of table.

PLAGUE—Continued

[C indicates cases, P, present]

Place		January—April 1945	May 1945	June 1945—week ended— 2	9	16	23	30
NORTH AMERICA								
Canada: Alberta Province.[4]								
Plague-infected squirrel							1	
SOUTH AMERICA								
Bolivia: Santa Cruz Department	C	[5] 14	61					
Ecuador:								
Chimboraza Province	C	6						
Loja Province	C	2						
Peru:								
Ancash Department	C	1						
Ica Department	C	[6] 2						
Lambayeque Department	C	12						
Libertad Department	C	10						
Lima Department	C	10						
Piura Department	C	4						
OCEANIA								
Hawaii Territory	C	1						
Plague-infected rats [7]		9						

[1] Includes 1 case of pneumonic plague.
[2] Suspected cases.
[3] For the period June 1-20, 1945.
[4] Plague infection in fleas was also reported for the weeks ended June 9 and June 23, 1945.
[5] Includes 4 confirmed cases.
[6] Includes 1 suspected case.
[7] Plague infection was also proved positive in a pool of 5 mice on Jan. 4, in a pool of fleas on Feb. 14, and in a pool of 40 fleas on Mar. 14, 1945.

SMALLPOX

[C indicates cases; P, present]

Place		January—April 1945	May 1945	June 1945—week ended— 2	9	16	23	30
AFRICA								
Algeria	C	109	26					
Angola	C	54						
Basutoland	C	306						
Belgian Congo	C	2,865	1,040					
British East Africa:								
Kenya	C	116	18		3			
Nyasaland	C	9						
Tanganyika	C	2,371	353		80			
Uganda	C	466	72	3	8			
Cameroon (French)	C	291	27		[1] 5			
Dahomey	C	92	8		[1] 2			
Egypt	C	782	147					
French Equatorial Africa	C	1,472	28					
French Guinea	C	1,002	337		[1] 5			
French West Africa: Dakar District	C	319	46		[1] 6			
Gambia	C	56	13		2	8		
Gold Coast	C	26					3	
Ivory Coast	C	240	105		[1] 6			
Mauritania	C	41	33					
Morocco (French)	C	179	72		[1] 25			
Nigeria	C	2,551	96					
Niger Territory	C	310	91		[1] 33			
Rhodesia, Northern	C	584	25		12			
Senegal	C	311	47		[1] 24			
Sierra Leone	C	2	10					
Sudan (Anglo-Egyptian)	C	[2] 3						
Sudan (French)	C	1,039	332		[1] 78			
Togo (British)	C	25						
Togo (French)	C	354	64		[1] 20			
Tunisia	C				[1] 2			
Union of South Africa [2]	C	395	P		P			P

See footnotes at end of table.

SMALLPOX—Continued

[C indicates cases; P, present]

Place		January—April 1945	May 1945	June 1945—week ended—				
				2	9	16	23	30
ASIA								
Arabia	C	16	3	1		1		
Ceylon	C	[4] 341	7					
China: Kunming (Yunnan Fu)	C	6	1					
India	C	143, 546						
Iran	C	344						
Iraq	C	13	8	8		1	1	
Syria and Lebanon	C	6						
Turkey (see Turkey in Europe.)								
EUROPE								
Belgium	C	1						
France	C	2						
Great Britian: Scotland	C	[2] 2						
Italy	C	1, 029	58	4	4	6		
Sicily	C	4						
Portugal	C	10	6			1		
Spain	C	23	3					
Canary Islands	C	1						
Turkey	C	274	8	2		5	1	
NORTH AMERICA								
Canada	C	6						
Guatemala	C	3	1					
Honduras	C	8						
Mexico	C	710						
Nicaragua	C	123						
SOUTH AMERICA								
Bolivia	C	150						
Brazil	C	[5] 56	1					
Columbia	C	113	48	12				
Ecuador	C	13	8					
Paraguay	C	1						
Peru	C	23						
Venezuela	C	[5] 436	[5] 28					

[1] For the period June 1-10, 1945.
[2] Imported.
[3] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Union of South Africa.
[4] Includes some cases of chickenpox.
[5] Includes cases of alastrim.

TYPHUS FEVER [6]

[C indicates cases; P, present]

Place		January—April 1945	May 1945	June 2	June 9	June 16	June 23	June 30
AFRICA								
Algeria	C	735	106					
Basutoland	C	50						
Belgian Congo [1]	C	58	48					
British East Africa: Kenya	C	16	8					
Egypt	C	10, 516	2, 488					
French West Africa: Dakar [1]	C	4	2		[2] 5			
Libya: Tripolitania	C	17						
Morocco (French)	C	3, 303	849				[3] 520	
Nigeria	C						P	
Rhodesia, Northern	C	11						
Sierra Leone	C	1						
Tunisia	C	360	5		[2] 4			
Union of South Africa	C	158	P		P			
ASIA								
China: Kunming (Yunnan Fu)	C	32						
India	C	21						
Iran	C	467						
Iraq	C	83	73	16	13	10	11	
Palestine [1]	C	23	1					
Syria and Lebanon	C	8	4					
Trans-Jordan	C	42						
Turkey (see Turkey in Europe.)								

See footnotes at end of table.

TYPHUS FEVER—Continued

[C indicates cases; P, present]

Place		January-April 1945	May 1945	June 1945—week ended—				
				2	9	16	23	30
EUROPE								
Albania	C	100						
Belgium	C	1						
Bulgaria	C	770						
France	C	5	10					[4] 15
Gibraltar	C	4						
Great Britain	C	1	2	3	1			
Greece	C	26	8					
Italy	C	13	35					
Malta and Gozo [1]	C	6						
Netherlands	C	6						
Portugal	C	39	2					
Rumania	C	[5] 7,831						
Slovakia	C	230						
Spain	C	8	5					
Sweden	C		[4] 3					
Turkey	C	1,483	300	35	66	45	42	37
Yugoslavia	C	137						
NORTH AMERICA								
Canada [1]	C	1						
Costa Rica	C	2	1		2			
Cuba [1]	C	1	1					
Guatemala	C	659	143					
Jamaica	C	12	4	1				
Mexico	C	703						
Panama (Republic)	C	1						
Puerto Rico [1]	C	28	21	4	2	4		
Virgin Islands [1]	C	4						
SOUTH AMERICA								
Bolivia	C	88						
Brazil	C	1						
Chile [1]	C	198						
Colombia	C	18	2					
Curacao	C	1						
Ecuador	C	160	35					
Peru	C	232						
Venezuela [1]	C	50	8					
OCEANIA								
Australia	C	79						
Hawaii Territory	C	33	6	4	2	5		

* Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reports cases as murine type.
[2] For the period June 1-10, 1945.
[3] For the period June 1-20, 1945.
[4] Repatriated refugees.
[5] For the period Jan. 1-20, 1945.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-April 1945	May 1945	2	9	16	23	30
AFRICA								
Gold Coast:								
Nsawam	C					1		
Takoradi	C				1			
Winneba	C						1	
Ivory coast:								
Gaoua	C			1				
Guiglo	C	1						
Sierra Leone: Moyamba	C					[1] 1		
SOUTH AMERICA								
Brazil:								
Goiaz State	D	75						
Minas Geraes State	D	17						
Colombia: Santander del Norte Department	D	[2] 5						
Peru: Cuzco Department	C	2						
Venezuela:								
Bolivar State	C	1						
Tachira State	D	2						1

[1] Suspected.
[2] For the period Jan. 1 to Mar. 11, 1945.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Jacksonville, Fla.

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Public Health Reports

Vol. 60 • AUGUST 3, 1945 • *No. 31*

A STUDY OF THE RODENT-ECTOPARASITE POPULATION OF JACKSONVILLE, FLA.

By A. S. RUMREICH, *Senior Surgeon,* and R. S. WYNN, *Acting Assistant Surgeon, United States Public Health Service*

Epidemiologic and bacteriologic investigations in mutually complementary fashion established several decades ago the centuries-old cognition of the existence of a rodent reservoir of bubonic plague and demonstrated the role of certain ectoparasites of these rodents in the transmission of human plague infection (*1, 2, 3, 4*). Comparatively recently, similar studies indicated the existence of an analogous situation with respect to a mild form of typhus fever (*5, 6, 7, 8, 9, 10, 11*) whose existence as a clinical entity had first been recognized, without identification, in this country (*12, 13*).

Despite the extensive cumulative contribution to our knowledge and understanding of plague epidemiology, over a period of more than half a century by numerous students representing many nationalities, sanitarians have remained at a loss to explain convincingly some aspects of the genesis of epidemics of the disease. The occurrence of plague, in epidemic dimensions, in some of our seaports, and the apparent immunity of others, has posed a still inadequately answered question.

The theory gradually evolved that vulnerability of communities to bubonic plague is governed by climatic conditions, particularly temperature (*14, 15, 16*). As a corollary of this postulate the idea developed that infectibility is directly related to the prevalence of ectoparasite vectors, notably the so-called tropical rat flea, *Xenopsylla cheopis* (*17, 18, 19, 20, 21, 22*).

Reformulations of this theory provided an impetus for the inauguration by quarantine officers of a series of surveys of the fleas of rats in seaports and attracted the attention of the First Pan American Conference of National Directors of Health, which appointed a committee to formulate a program for the investigation of plague. This committee recommended that surveys of the ectoparasites of rats and other rodents be made for the purpose of clearly defining the factors of the spread of plague, to the end that the degree of infectibility of a locality to plague may be determined. The committee expressed the belief that such surveys, if made by a considerable number of coun-

tries over a period of at least one year, under identical circumstances, with records of results that are strictly comparable, will serve more definitely to fix upon the exact species and quantities of rodents and ectoparasites that make possible the propagation of plague (*23*, *24*).

During the 7-year period following the conference several field investigations were made of the external parasites of rodents, and particularly of the prevalence of *X. cheopis* and other fleas harbored by domestic rats in some of our seaports, both on the mainland and in outlying possessions (*25*, *26*, *27*, *28*, *29*). The valuable fundamental contributions of these independent studies indicated a need for coordinated and synchronized studies in multilocations on the same basic pattern. Since then additional investigations have been made (*30*, *31*, *32*, *33*).

Following the clinical recognition, laboratory identification, and early epidemiologic elucidation of the typhus fever occurring endemically in the United States, the role of vector has been variously assigned to a number of ectoparasites, including sucking lice, fleas, ticks, bedbugs, mosquitoes, chiggers, and the parasited mites, several of which have been proved to be capable of transmitting the disease under experimental conditions. Also, the complete make-up of the animal reservoir has not as yet been ascertained, despite the general acceptance of the commensal rats as the principal reservoir.

The first opportunity to undertake a comprehensive study designed to provide definitive answers to many of the questions that had remained unanswered, some for several decades, seemed to be presented when the organizers and administrators of the work-relief program of the Federal government undertook to furnish labor and other help for the conduct of suitable public health programs and requested the submission of detailed specifications for a project related to the control of endemic typhus fever in this country. On the strength of authoritative assurances that a study over a 12-month period would receive support, a plan for simultaneous studies in the principal continental seaports, several inland communities, and seaports in outlying American possessions was formulated, submitted, and approved.

Field studies were inaugurated simultaneously in 30 localities, giving coverage of all representative areas in which bubonic plague was known to have occurred, or in which typhus fever was endemic, as well as important and presumably disease-free communities whose vulnerability to plague or typhus might be a matter of public concern. Owing to changes of policies governing the provision and employment of personnel, field work was interrupted in various stages of completion in nearly all of the 30 localities. In most of these the studies were abandoned, but in several it was possible to effect arrangements for carrying the work through to the end of the year, according to plan. Material was obtained from communities representing the Atlantic,

Gulf Coast, and Pacific seaboards, the inland typhus-endemic region, and our principal outlying territory.

Very soon after the completion of field work, the laboratory examination of collected material and the statistical processing of accumulated data were interrupted by the transfer of all professional and technical personnel to other duties.

A revived, and indeed heightened, interest in typhus fever as a traditional concomitant of war and of post-war disturbances has permitted a resumption of the processing of the material amassed nearly ten years ago. This paper is the first of what is intended to be a series of reports on the findings of the studies in the individual areas. These reports will provide a body of comparable data which will serve as the basis for a systematic treatment of epidemiologic features of plague and typhus in this country and in some of its outlying territory.

THE PORT OF JACKSONVILLE

Jacksonville is situated near the mouth of the St. Johns River in northeastern Florida, at 30° 19′ N. latitude and 81° 40′ W. longitude. Its altitude ranges from 10 to 25 feet above sea level. The incorporated city covers an area of 38.96 square miles. The estimated population in 1934 was 146,953, composed of 93,278 white persons and 53,675 persons of other races.

The port of Jacksonville is touched by steamship lines serving ports in the West Indies, South America, Europe, the Dutch East Indies, and Asia. The major part of the water-borne commerce is, however, coastwise shipping. The city is an important terminus of several railroad trunk lines. The principal import is fertilizer; the principal exports are logs, lumber, and naval stores. In coastwise traffic, vegetable products and fertilizer are the leading commodities; the same items comprise the limited internal shipments on the St. Johns River (*34*).

CHRONOLOGY AND TECHNIQUES OF FIELD OPERATIONS

Collection of material was begun in Jacksonville on January 8, 1934, and continued until December 22, 1934, with two major interruptions —one of 20 days, in March, the other of 37 days, in May and June— and three inconsequential minor interruptions of 3 to 5 days each. The number of trapping days totalled 243. The longer of the two major interruptions commenced on May 5, leaving only 2 trapping days in that month, viz, May 2 and 3; hence, this month was excluded from all calculations, and the small amount of material obtained on those two days was combined with that obtained during April.

The object of the field work was the procurement of representative samples of live animals from all parts of the surveyed area at all seasons of the year. Hence, no incentive was offered for large catches,

which might have led to a concentration of effort on heavily infested premises. Instead, emphasis was placed on a systematic coverage, at frequent intervals, of the entire city. In fact, a definite quota was originally established for the weekly catch, in order to provide a sample large enough to insure statistically reliable findings but not so large as to overtax available laboratory facilities. A constant pro-

TABLE 1.—*Monthly and annual means, indices, and infestations, Siphonaptera and* X. cheopis, *by principal host species*

Month	Rodent host		Siphonaptera[1]				*Xenopsylla cheopis*			
	Species	Adjusted net number	Number	Mean	Index	Infestation percent	Number	Mean	Index	Infestation percent
1934										
January	*R. norvegicus*	613	3,983	6.50	6.23	74.71	1,657	2.70	2.60	59.38
	R. rattus	96	510	5.31	5.31	75.00	295	3.07	3.07	60.42
	Total	709	4.493	6.34	6.10	74.75	1,952	2.75	2.66	59.52
February	*R. norvegicus*	648	4,147	6.40	5.40	72.53	1,463	2.26	2.22	54.63
	R. rattus	27	267	9.89	6.52	81.48	224	8.30	4.30	74.07
	Total	675	4,414	6.54	5.44	72.89	1,687	2.50	2.30	55.41
March	*R. norvegicus*	338	2,018	5.97	5.97	81.95	776	2.30	2.30	57.69
	R. rattus	13	40	3.08	3.08	76.92	21	1.62	1.62	38.46
	Total	351	2,058	5.86	5.86	81.77	797	2.27	2.27	56.98
April	*R. norvegicus*	487	4,481	9.20	7.92	85.83	1,650	3.39	3.37	69.82
	R. rattus	25	188	7.52	7.52	68.00	134	5.36	5.00	52.00
	Total	512	4,669	9.12	7.90	84.96	1,784	3.48	3.45	68.94
June	*R. norvegicus*	255	2,663	10.44	9.90	91.76	1,884	7.39	7.19	87.84
	R. rattus	8	41	5.12	5.12	87.50	36	4.50	4.50	87.50
	Total	263	2,704	10.28	9.76	91.63	1,920	7.30	7.11	87.83
July	*R. norvegicus*	426	3,646	8.56	8.54	94.60	2,988	7.01	7.00	92.72
	R. rattus	58	640	11.03	11.03	89.66	628	10.83	10.62	87.93
	Total	484	4,286	8.86	8.83	94.01	3,616	7.47	7.43	92.15
August	*R. norvegicus*	417	2,711	6.50	6.50	87.53	2,279	5.46	5.45	85.85
	R. rattus	38	150	3.95	3.95	78.95	140	3.68	3.68	78.95
	Total	455	2,861	6.29	6.29	86.81	2,419	5.32	5.30	85.28
September	*R. norvegicus*	302	1,478	4.89	4.89	88.08	1,270	4.20	4.20	85.10
	R. rattus	11	23	2.09	2.09	72.73	20	1.82	1.82	72.73
	Total	313	1,501	4.80	4.80	87.54	1,290	4.12	4.12	84.66
October	*R. norvegicus*	309	1,375	4.45	4.45	86.73	1,077	3.48	3.48	79.61
	R. rattus	11	14	1.27	1.27	54.54	13	1.18	1.18	45.45
	Total	320	1,389	4.34	4.34	85.62	1,090	3.41	3.41	78.44
November	*R. norvegicus*	274	1,075	3.92	3.92	82.12	581	2.12	2.12	64.96
	R. rattus	28	43	1.54	1.54	60.71	16	.57	.57	32.14
	Total	302	1,118	3.70	3.70	80.13	597	1.98	1.98	61.92
December	*R. norvegicus*	259	789	3.05	3.05	77.99	418	1.61	1.61	61.00
	R. rattus	20	36	1.80	1.80	60.00	23	1.15	1.15	50.00
	Total	279	825	2.96	2.96	76.70	441	1.58	1.58	60.22
Year	*R. norvegicus*	4,328	28,366	6.35	6.07	83.98	16,043	3.81	3.78	72.60
	R. rattus	335	1,952	4.78	4.48	73.23	1,550	3.82	3.41	61.79
	Total	4,663	30,318	6.28	6.00	83.35	17,593	3.83	3.78	71.94

[1] Includes 405 *Ctenocephalides felis* and 11 *Rhopalopsyllus gwyni*.

gression to new premises was required, individual field production records being so designed as to provide a check on such progression. The interruptions previously referred to and the associated turn-over of personnel precluded the maintenance of production schedules, hence the month-to-month variation in the yield, as shown in the first column of numerals in table 1.

TABLE 1A.—*Monthly and annual means and infestations,* N. fasciatus, L. segnis, *and* E. gallinacea, *by principal host species*

Month	Species of rodent host	*Nosopsyllus fasciatus*			*Leptopsylla segnis*			*Echidnophaga gallinacea*		
		Number	Mean	Infestation percent	Number	Mean	Infestation percent	Number	Mean	Infestation percent
1934										
January	*R. norvegicus*	130	0.21	9.14	1,407	2.30	44.04	756	1.23	12.72
	R. rattus	5	.05	2.08	202	2.10	53.12	8	.08	6.25
	Total	135	.19	8.18	1,609	2.27	45.28	764	1.08	11.85
February	*R. norvegicus*	103	.16	8.02	1,266	1.95	43.21	1,278	1.97	13.58
	R. rattus	1	.04	3.70	31	1.15	55.56	11	.41	3.70
	Total	104	.15	7.85	1,297	1.92	43.70	1,289	1.91	13.18
March	*R. norvegicus*	122	.36	14.79	884	2.62	55.03	205	.61	15.09
	R. rattus	0	0	0	19	1.46	53.85	0	0	0
	Total	122	.35	14.24	903	2.57	54.98	205	.58	14.53
April	*R. norvegicus*	146	.30	14.17	1,195	2.45	53.18	1,346	2.76	26.49
	R. rattus	4	.16	12.00	47	1.88	52.00	3	.12	8.00
	Total	150	.29	14.06	1,242	2.42	53.12	1,349	2.63	25.58
June	*R. norvegicus*	7	.03	2.74	113	.44	14.12	566	2.22	27.84
	R. rattus	0	0	0	2	.25	25.00	3	.38	25.00
	Total	7	.03	2.66	115	.44	14.45	569	2.16	27.76
July	*R. norvegicus*	3	.01	0.70	12	.03	2.35	614	1.44	28.40
	R. rattus	0	0	0	2	.03	3.45	10	.17	13.79
	Total	3	.01	.62	14	.03	2.48	624	1.29	26.65
August	*R. norvegicus*	0	0	0	6	.01	1.20	404	.97	25.66
	R. rattus	0	0	0	0	0	0	9	.24	15.79
	Total	0	0	0	6	.01	1.10	413	.91	24.84
September	*R. norvegicus*	2	.01	.66	23	.08	4.97	171	.57	17.55
	R. rattus	1	.09	9.09	0	0	0	2	.18	18.18
	Total	3	.01	.96	23	.07	4.79	173	.55	17.57
October	*R. norvegicus*	6	.02	1.94	82	.26	14.89	205	.66	16.50
	R. rattus	0	0	0	1	.09	9.09	0	0	0
	Total	6	.02	1.88	83	.26	14.69	205	.64	15.94
November	*R. norvegicus*	26	.09	8.03	221	.81	35.40	241	.88	21.53
	R. rattus	0	0	0	17	.61	25.00	10	.36	17.86
	Total	26	.09	7.28	238	.79	34.44	251	.83	21.19
December	*R. norvegicus*	34	.13	10.42	188	.72	32.82	146	.56	15.44
	R. rattus	2	.10	5.00	10	.50	25.00	1	.05	5.00
	Total	36	.13	10.04	198	.71	32.26	147	.53	14.70
Year	*R. norvegicus*	579	.12	6.42	5,397	1.06	27.38	5,932	1.26	20.07
	R. rattus	13	.04	2.90	331	.73	27.46	57	.18	10.32
	Total	592	.12	6.16	5,728	1.04	27.39	5,989	1.19	19.44

TABLE 1B.—*Monthly and annual means, indices, and infestations, Acarina, by combined host species* R. norvegicus—R. rattus

Month	Total number of rodents	Number of animals in 10-percent sample	Acarina			*Laelaps hawaiiensis*			
			Number	Mean	Infestation percent	Number	Mean	Index	Infestation percent
1934									
January	716	71	171	2.41	39.44	15	0.21	0.21	8.45
February	675	68	160	2.35	42.65	10	.15	.15	10.29
March	353	35	103	2.94	31.43	2	.06	.06	5.71
April	525	53	240	4.53	69.81	48	.91	.91	24.53
June	318	31	90	2.90	70.97	70	2.26	2.26	51.61
July	639	64	990	15.47	76.56	857	13.39	6.38	65.62
August	576	58	453	7.81	84.48	434	7.48	6.12	77.59
September	410	41	326	7.95	80.49	280	6.83	6.42	70.73
October	400	40	214	5.35	72.50	201	5.02	4.75	70.00
November	349	35	91	2.60	51.43	81	2.31	2.31	40.00
December	284	28	32	1.14	53.57	16	.57	.57	32.14
Year	5,245	524	2,870	5.04	61.21	2,014	3.56	2.74	41.52

Month	*Echinolaelaps echidninus*			*Liponyssus bacoti*			Other species
	Number	Mean	Infestation percent	Number	Mean	Infestation percent	Number
1934							
January	51	0.72	22.54	104	1.46	11.27	[1] 1
February	78	1.15	20.59	72	1.06	17.65	0.
March	87	2.49	20.00	14	.40	8.57	0
April	63	1.19	26.42	129	2.43	30.19	0
June	16	.52	22.58	4	.13	9.68	0
July	101	1.58	23.44	32	.50	9.38	0
August	18	.31	18.96	1	.02	1.72	0
September	41	1.00	26.83	0	.00	.00	[2] 5
October	12	.30	15.00	0	.00	.00	[3] 1
November	5	.14	11.43	5	.14	5.71	0
December	16	.57	25.00	0	.00	.00	0
Year	488	.91	21.16	361	.56	8.56	7

[1] *Myobia ensifera.* [2] *Atricholaelaps glasgowi.* [3] Cheyletidae.

TABLE 1C.—*Monthly and annual means and infestations, Anoplura, by combined host species* R. norvegicus—R. rattus

Month	Total number of rodents	Number of animals in 10 percent sample	Anoplura			*Polyplax spinulosa*			*Hoplopleura hirsuta*		
			Number	Mean	Infestation percent	Number	Mean	Infestation percent	Number	Mean	Infestation percent
1934											
January	716	71	262	3.69	40.84	217	3.06	38.03	[1] 45	0.63	12.68
February	675	68	400	5.88	29.41	74	1.09	25.00	326	4.79	13.24
March	353	35	52	1.48	37.14	48	1.37	34.28	4	.11	5.71
April	525	53	146	2.75	37.74	108	2.04	32.08	38	.72	11.32
June	318	31	74	2.39	54.84	67	2.16	54.84	7	.22	9.68
July	639	64	178	2.78	54.69	152	2.38	48.44	26	.41	14.06
August	576	58	98	1.69	46.55	66	1.14	43.10	32	.55	8.62
September	410	41	105	2.56	53.66	79	1.93	48.78	26	.63	17.07
October	400	40	61	1.52	40.00	50	1.25	35.00	11	.28	10.00
November	349	35	66	1.88	65.71	53	1.51	51.43	13	.37	22.86
December	284	28	53	1.89	39.28	41	1.46	32.14	12	.43	10.71
Year	5,245	524	1,495	2.59	45.44	955	1.76	40.28	540	.83	12.36

[1] Includes 3 *Hoplopleura acanthopus.*

Field workers furnished by the official work-relief agency were instructed and supervised by cadres of trained and experienced personnel from the Foreign Quarantine Division.

For trapping rats, steel animal traps of size No. 0 Victor were used. These traps are unsuited for trapping very small animals, hence the small proportion of live mice in the material. The traps were set, unbaited, in runways. Usually trap lines were run twice a day. Animals found alive were removed from the traps and placed in muslin cloth bags, one to the bag. Each bag was then securely tied and an identification tag attached.

Ectoparasites were collected only from such animals as were still alive when they reached the field station. The animals, in unopened bags, were placed in a glass jar and chloroformed. Ectoparasites were then recovered from these animals and the bags with the aid of a suction apparatus. After classification and enumeration the parasites from each animal were placed in a *homeopathic* vial containing 80 percent alcohol and shipped to the National Institute of Health for final identification.

Identification of collected ectoparasites was made by experienced entomologists of the Zoology Laboratory, with the assistance of trained entomologic technicians.

COMPOSITION OF MATERIAL

During the field operations there were collected in Jacksonville and examined in the field station a total of 5,357 live rodents, consisting of 4,853 *Rattus norvegicus*, 340 *Rattus rattus alexandrinus*, 66 *Rattus rattus rattus*, 2 *Sigmodon hispidus*, 41 young of undetermined species of the genus *Rattus* found in 6 nests, and 55 *Mus musculus*. Ectoparasites were obtained in the field station from 4,331 *R. norvegicus*, 288 *R. r. alexandrinus*, 53 *R. r. rattus*, 1 *S. hispidus*, 2 nests containing a total of 12 young of undetermined species of *Rattus*, and 3 *M. musculus*. Owing to losses from breakage of specimen containers in transit, desiccation of imperfectly sealed containers, and unascertainable causes incidental to the aforementioned interruptions of work and turn-over of personnel, there were ultimately received at the National Institute of Health, and examined in the Zoology Laboratory, ectoparasite specimens from 3,882 *R. norvegicus* (4 of which were young animals found in a nest), 237 *R. r. alexandrinus*, 39 *R. r. rattus*, 1 *S. hispidus*, 12 young animals of undetermined species of *Rattus* found in 2 nests, and 3 *M. musculus*.

In addition, 7 leprous rats, all of them *R. norvegicus*, were not examined for ectoparasites but were sent alive to the Division of Infectious Diseases, National Institute of Health, for special study.

All of the fleas received in good condition by the National Institute of Health were examined and identified. The examination and iden-

tification of mites and lice, especially the former, required a disproportionately large amount of tedious and time-consuming work, as compared with the relatively easy and expeditious processing of fleas. As the available number of skilled technical personnel was limited, it was decided to restrict the examination of parasites other than fleas to material from 10 percent of the number of live animals. In order to insure a random sampling, specimen material was examined from each tenth rat, hence from 524 of the 5,245 rodents of the combined *R. norvegicus*—*R. rattus* species. Whenever the tenth animal chanced to be one which had been found by the field station to be infested but for which the specimen had been lost, the infested animal substituted was that which was numerically nearest the missing one. If selection lay between two numerically equidistant animals, preference was given to the one most closely corresponding, in species, maturity, and environment to the source of the missing specimen.

The ectoparasite material identified at the National Institute of Health consisted of 30,353 Siphonaptera, or fleas; 3,695 Acarina, or mites; and 2,441 Anoplura, or sucking lice. Of the Siphonaptera, 17,622 or 58.1 percent, were *Xenopsylla cheopis;* 5,990, or 19.7 percent, *Echidnophaga gallinacea;* 5,732, or 18.9 percent, *Leptopsylla segnis;* 593, or 2.0 percent, *Nosopsyllus fasciatus;* 405, or 1.3 percent, *Ctenocephalides felis,* and 11 *Rhopalopsyllus gwyni.* Of the Acarina in the 10-percent sample, 2,014, or 70.2 percent, were *Laelaps hawaiiensis;* 488, or 17.0 percent, *Echinolaelaps echidninus;* 361, or 12.6 percent, *Liponyssus bacoti;* 5 *Atricholaelaps glasgowi,* 1 *Myobia ensifera,* and 1 mite of the Cheyletidae. Of the Anoplura, likewise limited to the 10-percent sample, 955, or 63.9 percent, were *Polyplax spinulosa;* 537, or 35.9 percent, *Hoplopleura hirsuta,* and 3 *Hoplopleura acanthopus.*

In addition, material was examined in the laboratory from a number of rodents that were not included in the 10-percent sample described above, and consisted of 232 *L. hawaiiensis,* 590 *E. echidninus,* 2 *L. bacoti,* 1 of the Cheyletidae, 780 *P. spinulosa,* 154 *H. hirsuta,* and 12 *H. acanthopus.* Since the selection of specimens from these additional animals was not governed by the rigid sampling rule that applied to the 10-percent sample, the results of the identification of these additional, nonsample specimens have not been included in any tabulation nor in the computation of any statistical constants.

Not included in the tabulations of statistically analyzed material were 35 fleas recovered from rodents other than trapped *R. norvegicus* and *R. rattus,* distributed as follows: from 1 *S. hispidus,* 1 *L. segnis;* from 1 *M. musculus,* 2 *X. cheopis;* from 1 *M. musculus,* 1 *E. gallinacea;* from 1 *M. Musculus,* 1 *L. segnis;* from 1 nest of 7 *Rattus* of undetermined species, 22 *X. cheopis;* from 1 nest of 5 *Rattus* of undetermined

species, 1 *X. cheopis;* and from 1 nest of 4 *R. norvegicus*, 4 *X. cheopis*, 1 *N. fasciatus*, and 2 *L. segnis*.

ADJUSTMENT FOR LOST SPECIMENS

Of the 5,245 rats of the species *R. norvegicus* and *R. rattus* (exclusive of young in nests) collected alive and examined in the Jacksonville field station, 4,668, or 89 percent, were found to harbor ectoparasites. Fleas were identified on 4,353 of these animals, or 83.4 percent of the total examined. From an additional 315 rats, either mites or lice, or both of these ectoparasites, were obtained, but not any fleas.

By the time of final identification of flea species at the National Institute of Health, 514 specimen containers which had been recorded in the field station as containing fleas were missing. Any calculations based upon the 5,245 live rats examined in the field station would obviously have yielded results showing disparity from those which

TABLE 2.—*Adjustment for lost specimens*

Month	A Number of live animals examined in field	B Number of specimens examined in laboratory	C Number of specimens missing	D Number of parasitized animals (B+C)	E Number of noninfested animals (A−D)	F Percent of specimens missing (C/D)	G Percent missing applied to noninfested animals (F×E)
1934							
January	716	530	5	535	181	0.9	1.6
February	675	492	0	492	183	0	0
March	353	287	2	289	64	.7	.4
April	525	435	11	446	79	2.5	2.0
June	318	241	50	291	27	17.2	4.6
July	639	455	146	601	38	24.3	9.2
August	576	395	105	500	76	21.0	16.0
September	410	274	85	359	51	23.7	12.1
October	400	274	68	342	58	19.9	11.5
November	349	242	38	280	69	13.6	9.4
December	284	214	4	218	66	1.8	1.2
Year	5,245	3,839	514	4,353	892	----------	68.0

Month	H Number of noninfested animals excluded as adjustment (G)	I Total number of animals excluded (C+H)	J Adjusted net number of live animals (A−I)	K Adjusted net number of noninfested animals (E−H)	L Infestation percent, field, original (D/A)	M Infestation percent, laboratory, adjusted sample (B/J)
1934						
January	2	7	709	179	74.7	74.8
February	0	0	675	183	72.9	72.9
March	0	2	351	64	81.9	81.8
April	2	13	512	77	85.0	85.0
June	5	55	263	22	91.5	91.6
July	9	155	484	29	94.0	94.0
August	16	121	455	60	86.8	86.8
September	12	97	313	39	87.6	87.5
October	12	80	320	46	85.5	85.6
November	9	47	302	60	80.2	80.1
December	1	5	279	65	76.8	76.7
Year	68	582	4,663	824	83.4	83.3

would have been obtained had the entire original material of 4,668 specimens reached the final identification stage intact. A correction was therefore made by excluding from the total number of animals a monthly quota of non-flea-infested rats, proportionate to the number of missing specimens from flea-infested rats, and corresponding also, as nearly as possible, in species of rat. The total number of noninfested rats excluded in this manner was 68, the resultant sample utilized for calculation of statistical constants for Siphonaptera thus consisting of 4,663 rats corresponding very closely in monthly infestation rates to the original material.

The steps in making the adjustment are given in table 2. The close correspondence maintained in monthly and annual infestation rates between the intact original material and the adjusted working sample will be noted by comparing columns L and M. In addition, deviations due to the adjustment in the several environmental categories of zone and type of premises are less than 1 percent in all cases with the exception of the water-front zone. The last-mentioned shows a 6-percent increase, the change being due possibly to the relative smallness of the sample in that category.

DEFINITION AND DERIVATION OF STATISTICAL CONSTANTS EMPLOYED[1]

As used throughout this study with reference to ectoparasites, the mean is the arithmetic mean, or average number per live animal host of the ectoparasites in question. The infestation rate is the proportion of live animals parasitized, expressed in the form of a percentage. Each biometric constant representing ectoparasites is based upon the entire animal host population of the category under consideration, all noninfested as well as infested animals being included in the calculations.

Every statistical constant designated as an annual constant is the arithmetic mean of all available monthly values in its own category. This method of calculation provides an unbiased cross section of the annual experience by obviating the weighting effect of the larger of unequal monthly host samples—an important precaution in view of the seasonal variation in parasite prevalence.

Hitherto, the constant designated index has been identical with the arithmetic mean. In this sense the term "index" has been universally employed by American workers for the past two decades. Objections have been raised to the use of this value, on the ground that even a relatively few very high parasite counts can distort the index so that it may not fairly represent the parasite prevalence and distribution. Alternative methods of correcting such a situation have been (*a*) limitation of counts to some arbitrarily chosen maximum, all excess values being discarded, and (*b*) total exclusion of animals with counts

[1] The standard error is used throughout as the measure of sampling error of statistical constants.

felt to be excessively high. The latter method, most often used today, is objectionable in that it alters the infestation percentage, thus introducing a new distortion while seeking to eliminate another. Both of these methods are open to the criticism that they are dependent on personal caprice and hence are devoid of objectivity and mathematical regulation.

Since neither of the above-described methods of adjustment has provided a satisfactory solution of the dilemma created by so-called abnormal counts, the superiority has been stressed of the infestation percentage over the traditional index as a measure of parasite prevalence (*30*, *33*).

In our opinion there is a need for an index that will be free of the torsional effect of atypical parasite counts and that can be derived by a method that will preserve the integrity of infestation rates and also be comparatively immune from the criticism attending the invocation of arbitrary personal selection.

An index that will fulfill these requirements may be derived by mathematically fitting an appropriate curve to the frequency distribution of parasite counts in any host population, and thus determining their normal upper limit. By this method the utilizable or normal maximum count is predetermined by the inherent characteristics of the frequency distribution. Adjustment of host samples either to a standard population or to a percentile basis eliminates any effects due solely to wide differences between magnitudes of samples. The appropriate curve in each case is simply that of the mathematical function which produces the best fit.

When the frequencies calculated from the fitted curve are plotted on a grid, with the parasite counts as abscissae and the host numbers as ordinates, utilizing the rule governing decimals (*35*), the 0.5 ordinal value of the function determines the terminal value of abscissae. The latter value in turn determines the maximum parasite counts admissible for computation of the index, all counts in excess of that limit being held to the value of the maximum.

An example of the application of this method of determining maxima for the calculation of indices is illustrated in figure 1. On the arithmetic grid an exponential curve of the function $Y=ab^X$ has been fitted by the method of least squares to *X. cheopis* counts plotted as increasing values of X on the abscissal axis against numbers of rodent hosts plotted as decreasing values of Y on the ordinal axis. The curve begins at $X=10$, the point marking a change in the rate of decrease in Y values (0–5=84 percent; 5–10=76 percent; 10–15=47 percent; 15–20=45 percent; 20–25=44 percent; 25–30=40 percent, etc.) and extends to $X=49$, the highest X value in the first quintuple containing a majority of zero Y values. The logarithmic expression of the exponential curve $\log Y=mX+k$ where $m=\log b$ and $k=\log a$,

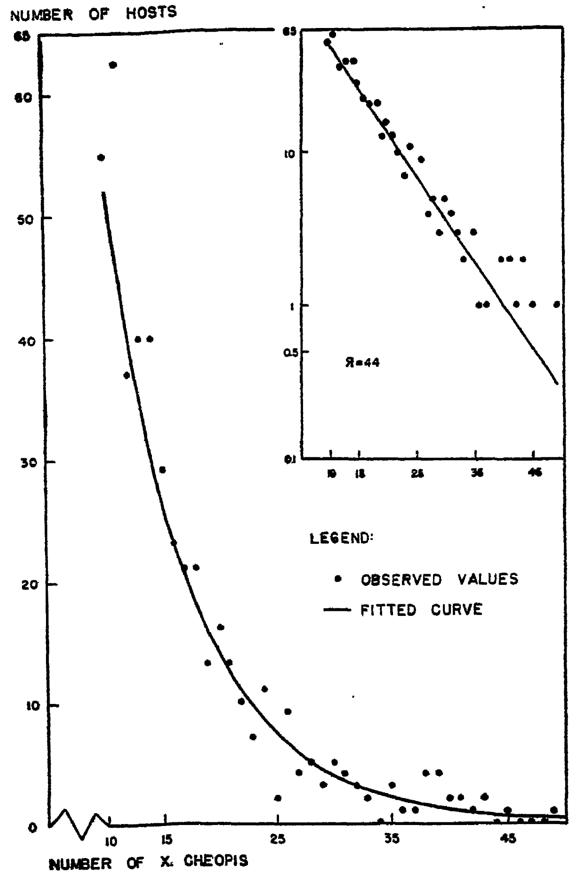

FIGURE 1.—Exponential curve of function $Y=ab^X$ fitted by least squares to frequency distribution of *X. cheopis* counts in determining upper limit for calculation of the index. Insert: Straight line fitted to same data on semi-logarithmic grid.

solved by the method of least squares, resulted in the function $\log Y = -0.05664X + 2.2829$. The point beyond which value $Y=0.5$ or less was reached at $X=44$, which may be designated as the limiting function Я.[2] The curve then limits the *X. cheopis* count per host to 44. The goodness of fit measured by the index of correlation $\rho_{\log YX}$ *(36)* between the observed and the calculated series of frequencies is 0.946 ± 0.017.

Similarly a power curve of the function $Y=aX^b$ fitted to the frequency distribution of *L. hawaiiensis* counts yields a value of Я=36. In computation of the index for *L. hawaiiensis*, specific parasite counts are then held to a maximum of 36 per host. The value of the index of correlation, $\rho_{\log Y \log X}$, as a measure of the goodness of fit is 0.943 ± 0.018.

[2] Selection of this Cyrillic symbol for the limiting function was prompted by the apparent exhaustion of the Greek and Latin alphabets as sources of statistical and scientific symbolic nomenclature.

The conclusion that the above fitted curves adequately represent the data is further substantiated through the use of the χ^2 test of goodness of fit.

BIOMETRIC CONSTANTS OF PRINCIPAL HOST SPECIES

Computations of the basic constants for the various species of fleas by species of the two principal animal hosts are shown in tables 1 and 1A. Since the two subspecies, *Rattus rattus alexandrinus* and *Rattus rattus rattus*, of the species *Rattus rattus* intergrade with each other and are almost identical except for differences in coloration, they have been combined under the species classification.

It will be noted that in the composite group Siphonaptera the values of the three annual biometric constants are substantially and consistently higher for *R. norvegicus* than for *R. rattus*. Tests for statistical significance of these differences give mean differences of the monthly values of the mean, the index, and the infestation rate, 2.1, 2.5, and 3.1 times their respective standard errors,[3] indicating a lack of significance for the mean, but a high probability of significance for the index, and a practical certainty of statistical significance in the case of the difference in infestation rates (*38*). However, when the composition of the raw material is noted, and the inconsistencies in the corresponding values for the individual species making up the Siphonaptera category are taken into consideration, it becomes evident that the apparently high degree of statistical significance must yield to the absence of biologic significance. Therefore only biometric constants computed for individual parasite species will be used for comparisons and analysis.

Considering individually the several constituent species comprising the category Siphonaptera, it is found that tests for statistical significance applied to the monthly biometric constants give the following values of *mean monthly difference*/$\sigma = t$ for the mean and infestation, respectively, of the compared species of *Rattus: X. cheopis*, 0.0 and 2.3; *N. fasciatus*, 2.3 and 2.0; *L. segnis*, 3.0 and 0.0; *E. gallinacea*, 5.1 and 5.2. For the *X. cheopis* index the corresponding value is 0.6. It is evident that consistently significant differences between the two host species *R. norvegicus* and *R. rattus* occur only in the case of *E. gallinacea*. Because of this lack of statistically significant differences between the two components of the host sample in biometric constants for all but the one ectoparasite species, *E. gallinacea*, and the overwhelming preponderance of one host species, *R. norvegicus* constituting 92.8 percent of the total sample, for purposes of further statistical treatment the two rodent species will be combined.

[3] The standard deviation used in these tests is the root-mean-square of the deviations of monthly differences from the mean of such differences (*37*).

SEASONAL VARIATION OF PARASITIZATION

The influence of climatic conditions on the breeding, hatching, development, and survival of *X. cheopis* and *N. fasciatus* have been studied intensively by workers in several countries, with varying techniques, inconstant results, and conflicting conclusions. It is not our intent at this time to attempt an evaluation of those studies.

It is evident from tables 1, 1A, 1B, and 1C that marked differences exist between the monthly values of each category of constants, and furthermore that the pattern of these differences varies as between the several species of ectoparasites.

TABLE 3.—*Meteorologic conditions in Jacksonville before and during the period of field operations*

Month	Contemporary measurement			Previous measurement		
	Mean temperature (degrees Fahrenheit)	Total precipitation (inches)	Mean relative humidity	Mean temperature (degrees Fahrenheit) 62-year average	Total precipitation (inches) 64-year average	Mean relative humidity 52-year average
1934						
January	58.0	1.08	78.5	56.0	2.70	80.0
February	54.2	3.48	75.0	57.9	2.98	77.5
March	61.4	2.18	78.0	63.0	3.16	76.0
April	69.5	2.92	72.5	68.6	2.69	73.5
May	74.0	6.33	81.0	74.8	4.09	75.5
June	80.7	13.23	81.0	79.9	5.86	78.5
July	82.5	5.07	78.5	81.8	6.53	80.0
August	82.2	5.98	81.0	81.5	5.86	82.5
September	79.2	1.99	84.5	78.5	7.07	83.5
October	73.0	5.24	81.0	70.9	4.40	81.0
November	64.3	.31	78.5	62.5	2.01	80.0
December	55.7	.70	76.0	56.6	2.90	80.5
Year	69.6	48.51	78.8	69.3	50.25	79.0

The meteorologic conditions obtaining in Jacksonville during the period of field operations are given in table 3. For purposes of future reference, the corresponding average measurements for several preceding decades are also given. The temperature given is the mean of the maximum and minimum daily dry bulb readings throughout each month. The figures on precipitation are self-explanatory. The relative humidity figures are the averages of daily 8 a. m. and 8 p. m. readings throughout the month.

The simplest grouping that can be made for the purpose of assessing the relationship of the degree of parasitization to meteorologic conditions is a division into two approximately equal periods of dissimilar conditions. The 11 months of field operations may thus be divided into two groups, viz, one of 5 consecutive months, June to October; the other of 6 months, November to April. The first, or warm weather season, is characterized by mean monthly temperatures in excess of 72° F. In this period the measurements of mean relative humidity are

78.5 percent of saturation or higher. It is also the period of the heaviest rainfall. In the second, or cold weather period, monthly mean temperatures are all below 70° F.; the relative humidity measurements are never higher than 78.5 percent; and the precipitation is at a low level throughout.

Tests of statistical significance of the differences between the mean monthly values for the warm and the cold weather periods of the biometric constants, shown in table 4, indicate that the higher warm weather values for *X. cheopis* and *L. hawaiiensis* are highly significant, as are the lower warm weather values for *N. fasciatus* and *L. segnis*, whereas there are no significant differences for *E. gallinacea* or *P. spinulosa*.

To determine the quantitative relationship between the several constants and meteorologic measurements, coefficients of correlation have been computed (*40*) and are shown in table 5. Consistently high

TABLE 4.—*Seasonal differences in means, indices, and infestations, principal ectoparasite species, by combined host species* R. norvegicus—R. rattus

Ectoparasite species	Biometric constant	Sign of $\bar{d}$, warm: cold seasons	Critical ratio [1]	Odds against chance occurrence
X. cheopis	Mean	+	3.89	270:1
	Index	+	4.01	320:1
	Infestation	+	8.58	>10,000:1
N. fasciatus	Mean	−	4.32	510:1
	Infestation	−	6.14	>10,000:1
L. segnis	Mean	−	4.25	400:1
	Infestation	−	7.34	>10,000:1
E. gallinacea	Mean	−	.32	<1:1
	Infestation	+	1.74	7:1
L. hawaiiensis	Mean	+	3.70	200:1
	Index	+	5.53	2,500:1
	Infestation	+	6.27	>10,000:1
P. spinulosa	Mean	+	.02	<1:1
	Infestation	+	2.10	15:1

[1] $\frac{\text{Difference between seasonal means}}{\text{Standard error of difference}}$. The standard error of the difference $=\sqrt{\frac{S(d_1^2)+S(d_2^2)}{N_1+N_2-2}\cdot\frac{N_1+N_2}{N_1N_2}}$, where $S(d^2)$ is the sum of the squares of monthly deviations measured from the seasonal mean, and N is the number of months (*39*).

TABLE 5.—*Values of coefficients of correlation between biometric constants and meteorologic factors*

Ectoparasite species	Biometric constant	Meteorologic measurement: Temperature	Rainfall	Humidity
X. cheopis	Mean	0.857±0.088	0.792±0.124	0.388±0.283
	Index	.870± .081	.780± .131	.399± .280
	Infestation	.970± .020	.644± .195	.594± .216
N. fasciatus	Mean	−.642± .196	−.418± .275	−.677± .181
	Infestation	−.740± .151	−.480± .257	−.764± .139
L. segnis	Mean	−.696± .172	−.370± .288	−.677± .181
	Infestation	−.817± .111	−.465± .261	−.739± .151
E. gallinacea	Mean	.084± .331	.457± .264	−.528± .240
	Infestation	.776± .133	.609± .210	.070± .332
L. hawaiiensis	Mean	.788± .126	.238± .314	.478± .257
	Index	.853± .091	.263± .310	.694± .173
	Infestation	.854± .090	.403± .279	.684± .177
P. spinulosa	Mean	.125± .328	.046± .333	.039± .333
	Infestation	.694± .173	.414± .276	.654± .191

positive correlation is evident for *X. cheopis* and *L. hawaiiensis* with respect to temperature. Somewhat lower values in the opposite direction, i. e., negative correlations, obtain for *N. fasciatus* and *L segnis.* A positive correlation between temperature and the infestation rates for *E. gallinacea* and P. *spinulosa* is not corroborated by the means nor by indices (0.439+0.269 and 0.402+0.279, respectively) computed by the *limiting function* method described above, and hence must be disregarded.

In comparison with the degrees of correlation between the biometric constants with mean temperature referred to above, the corresponding measurements expressing association between these constants and either rainfall or relative humidity are of a definitely lower order, with the exception of the slightly higher negative values for *N. fasciatus* and humidity.

ENVIRONMENTAL FACTORS IN PARASITIZATION

It has been conventional practice for many years to consider data gathered in rodent ectoparasite surveys by zones into which the city surveyed was divided. In recent years some workers have discarded such a classification and have stressed the role played by the location of the trapping point with reference to the interior and exterior of buildings. Both of the foregoing classifications are utilized in our analysis. Finally, in view of epidemiologic evidence incriminating food establishments as the principal foci of typhus infection, a grouping of premises has been made according to their use, or type of enterprise carried on therein.

The city has been divided into three zones, whose boundaries are shown on the map (fig. 2). Because of the small number of rodents obtained on the docks, the latter have been combined with the water front. The commercial zone includes all city blocks in the principal business area which are predominantly commercial in character on at least one side of the square. This zone thus inevitably includes a considerable number of residential premises located on the fringe of the business district. The residential zone consists of the remainder of the city and embraces isolated or neighborhood business premises.

Premises have been divided according to type into three groups: food establishments, other businesses, and residences. Food establishments include restaurants, groceries, feed warehouses, abattoirs, and docks shipping food commodities. In the case of premises with varied multiple listing, preference was given to (1) food, (2) other business, and (3) residential classification, in that order. Separate premises were denoted by individual addresses.

From table 6 it will be noted that the indices and infestation percentages of *X. cheopis* and *L. hawaiiensis* are somewhat higher in the commercial zone than in the residential zone and considerably

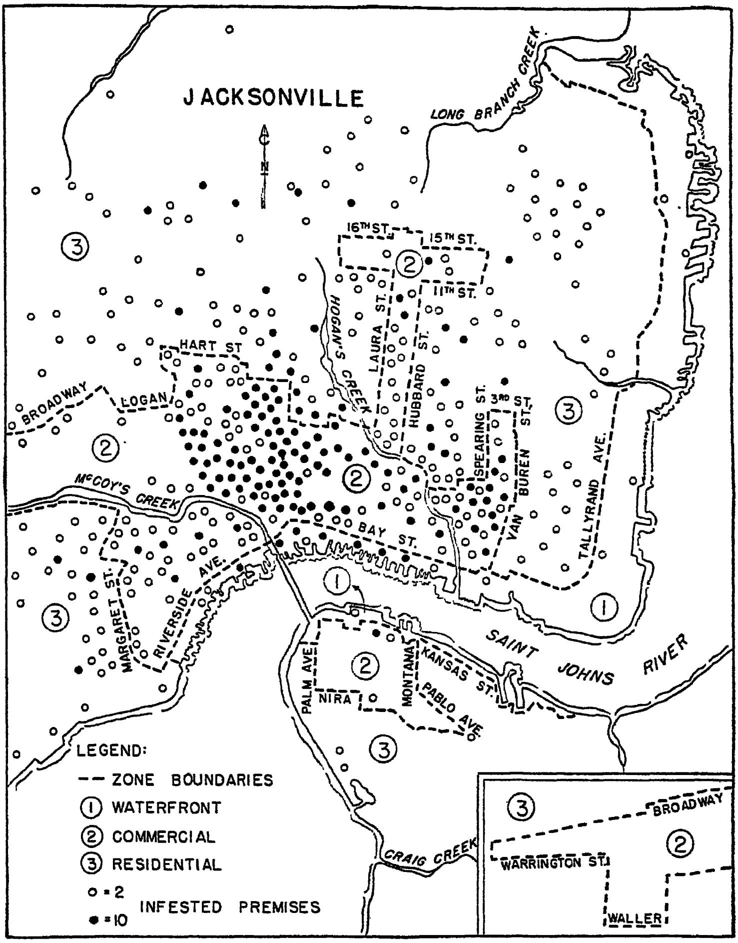

FIGURE 2.—Map of Jacksonville, showing zone boundaries and locations of infested premises.

TABLE 6.—*Annual means, indices, and infestations,* X. cheopis *and* L. hawaiiensis, *by zone, trap location, and type of premises*

	Adjusted net number of rodents examined	*Xenopsylla cheopis*				*Laelaps hawaiiensis*			
		Number	Mean	Index	Infestation percent	Number in 10-percent sample	Mean	Index	Infestation percent
Zone:									
Water-front	353	945	2.64	2.64	58.67	23	0.45	0.45	19.86
Commercial	3,258	13,447	4.13	4.06	74.60	1,720	3.96	2.98	45.18
Residential	1,052	3,201	3.14	3.14	66.79	271	2.17	1.98	31.09
Location of trap:									
Indoors	4,080	15,840	3.92	3.86	72.77	1,767	3.65	2.70	41.15
Outdoors	583	1,753	3.43	3.43	66.74	247	3.08	3.08	32.85
Type of premises:									
Food establishment	2,619	9,241	3.78	3.73	71.03	873	3.87	3.16	43.51
Other business	541	2,160	4.08	3.90	72.66	604	6.23	4.25	54.70
Residence	1,503	6,192	3.75	3.74	71.88	537	2.30	1.79	32.77

higher in the commercial over the water-front zone. "Student's" *t*-test applied to these differences discloses statistical significance only in the latter difference.[4] No significant differences by zone occur in the case of *N. fasciatus*, *L. segnis*, and *P. spinulosa*. *E. gallinacea* displays significantly higher values in the commercial and residential zones over the water-front zone[5], but no significant differences between residential and commercial zones.

TABLE 6A.—*Annual means and infestations*, N. fasciatus, L. segnis, E. gallinacea, *and* P. spinulosa, *by zone, trap location, and type of premises*

	Nosopsyllus fasciatus			*Leptopsylla segnis*			*Echidnophaga gallinacea*			*Polyplax spinulosa*		
	Number	Mean	Infestation percent	Number	Mean	Infestation percent	Number	Mean	Infestation (percent)	Number in 10-percent sample	Mean	Infestation percent
Zone:												
Water-front	85	0.17	7.66	944	1.60	30.99	48	0.13	6.09	35	0.63	35.67
Commercial	355	.10	5.96	3,668	.98	27.15	4,245	1.17	20.42	659	1.74	40.27
Residential	152	.13	6.21	1,116	1.00	25.68	1,696	1.46	22.99	261	1.82	34.48
Location:												
Indoors	449	.10	5.53	5,007	1.00	26.60	4,240	.98	17.93	843	1.76	39.95
Outdoors	143	.24	10.00	721	1.32	31.18	1,749	3.03	27.43	112	1.52	35.30
Premises:												
Food establishment	308	.09	5.07	3,534	.90	23.74	2,577	.79	15.11	616	2.14	42.95
Other business	81	.13	6.87	696	1.10	31.13	493	.84	17.23	77	.80	24.22
Residence	203	.18	8.22	1,498	1.35	33.04	2,919	1.93	25.51	262	1.32	43.46

Considered by trap location, significant differences do not exist between indoors and outdoors for *X. cheopis*, *L. hawaiiensis*, *L. segnis*, or *P. spinulosa*, but occur in the case of *N. fasciatus*[6] and *E. gallinacea*,[7] both of the last-mentioned having higher values in outdoor samples.

The type of premises does not seem to be associated with any verifiable consistently significant differences in statistical constants representing ectoparasites. Hence the high risk of infection assigned to food establishments by epidemiologic evidence must seek explanation on some other basis than that of higher flea counts or infestation. Such an explanation is furnished by table 7, which shows that the average rat yield per infested food establishment is more than double that for other business or residential premises. This ratio holds good irrespective of zone.

INTERRELATIONSHIP OF BIOMETRIC CONSTANTS

It will have been noted that throughout the preceding consideration of the influences of various meteorologic and physical environmental factors on specific ectoparasites, a marked parallelism exists between the index and infestation values. This is indicated by the

[4] Values of P: *X cheopis*—index=0.001, infestation=0.002, *L. hawaiiensis*—index=0.008, infestation=0.016.
[5] $P=0.002$—<0.001.
[6] $P=0.049$, 0.026.
[7] $P=0.006$, 0.003.

TABLE 7.—*Live rat yield per premises by zone and type of premises*

	Type of premises			
	All	Food establishment	Other business	Residence
Number of premises yielding live rats:				
Entire city	1,827	613	274	940
Water-front zone	92	63	19	10
Commercial zone	1,190	407	210	573
Residential zone	545	143	45	357
Number of live rats obtained:				
Entire city	5,245	2,878	603	1,764
Water-front zone	400	335	43	22
Commercial zone	3,578	2,002	479	1,097
Residential zone	1,267	541	81	645
Average yield per infested premises:				
Entire city	2.9	4.7	2.2	1.9
Water-front zone	4.3	5.3	2.3	2.2
Commercial zone	3.0	4.9	2.3	1.9
Residential zone	2.3	3.8	1.8	1.8

values of the correlation coefficient r for index and infestation, as follows: *X. cheopis*, 0.904±0.061; *L. hawaiiensis*, 0.942±0.038. This condition holds good also for the mean and infestation in those instances where the mean does not deviate excessively from the median, as shown by the following values of r for mean and infestation: *N. fasciatus*, 0.956±0.029; *L. segnis*, 0.952±0.031.

Reference has been made to arguments for the superiority of the infestation rate over the mean as a measure of ectoparasite prevalence. However, in several instances in the Jacksonville material where the measurements of statistical significance were of border-line dimensions, one of these two constants—sometimes one, sometimes the other—was below the conventionally accepted level of significance, while the other was definitely above that level. Placing reliance in such cases upon only one of the values can lead to disputable conclusions. It is therefore our opinion that in the present state of our knowledge the use of both the mean and the infestation rate is preferable to the use of either one alone, and furthermore, that in asymmetrical frequency distributions containing atypical high ectoparasite counts, the mean should be adjusted toward the median by an appropriate precision mathematical procedure. It must be borne in mind that, after all, the ultimate purpose of these constants is the very practical one of measuring the infectibility of communities and evaluating the roles of several vectors of disease. Hence it would seem that a valid appraisal of the relative utility of the constants can only be made in the light of their correlation with the actual incidence of human plague or typhus. A forthcoming report will include a quantitative study of these relationships and an assay of their significance in the epidemiology of these diseases.

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DEATHS DURING WEEK ENDED JULY 7, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 7, 1945	Corresponding week, 1944
Data for 90 large cities of the United States:		
Total deaths	8, 536	7, 777
Average for 3 prior years	7, 761	
Total deaths, first 27 weeks of year	249, 558	253, 098
Deaths under 1 year of age	566	514
Average for 3 prior years	565	
Deaths under 1 year of age, first 27 weeks of year	16, 346	16, 618
Data from industrial insurance companies:		
Policies in force	67, 372, 672	66, 653, 220
Number of death claims	10, 353	10, 036
Death claims per 1,000 policies in force, annual rate	8. 0	7. 9
Death claims per 1,000 policies, first 27 weeks of year, annual rate	10. 8	10. 4

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 14, 1945

Summary

A total of 254 cases of poliomyelitis was reported for the current week, as compared with 154 last week, 462 for the corresponding week last year, and a 5-year (1940–44) median of 180. Approximately 69 percent of the current total increase was accounted for by the increases in 7 States which reported more than 8 cases each and a total of 167 cases. These States are as follows (last week's figures in parentheses): New York 29 (21), New Jersey 23 (10), Ohio 10 (5), South Carolina 11 (6), Tennessee 27 (18), Texas 45 (21), California 22 (18).

The total cases reported since March 17, the date of lowest weekly incidence this year, is 1,281, as compared with 1,489 and 1,324 for the respective periods of 1944 and 1943. The total for the year to date is 1,678, as compared with 974 for the 5-year median, and 1,752 for the same period last year. For the first time this year the cumulative total is below that for the corresponding period last year.

Of the total of 128 cases of meningococcus meningitis reported, as compared with 109 last week and a 5-year median of 63, 18 occurred in New York, 12 in California, 9 in Texas, and 8 in Michigan. The cumulative figure is 5,655, as compared with 12,232 for the corresponding period last year and a 5-year median of 2,143.

Of the total of 35 cases of Rocky Mountain spotted fever reported for the week, 29 occurred in States east of the Mississippi River (16 in Virginia). The total to date is 204, as compared with 237 for the corresponding period last year.

A total of 8,174 deaths was recorded during the week in 93 large cities of the United States, as compared with 8,637 last week, 8,845 for the corresponding week last year, and a 3-year (1942–44) average of 8,340. The total to date is 260,122, as compared with 264,129 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended July 14, 1945, and comparison with corresponding week of 1944, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended— July 14, 1945	Diphtheria: Week ended— July 15, 1944	Diphtheria: Median 1940–44	Influenza: Week ended— July 14, 1945	Influenza: Week ended— July 15, 1944	Influenza: Median 1940–44	Measles: Week ended— July 14, 1945	Measles: Week ended— July 15, 1944	Measles: Median 1940–44	Meningitis, meningococcus: Week ended— July 14, 1945	Meningitis, meningococcus: Week ended— July 15, 1944	Meningitis, meningococcus: Median 1940–44
NEW ENGLAND												
Maine	0	0	0	------	1	------	1	14	87	1	1	1
New Hampshire	0	0	0	------	------	------	1	2	3	0	0	0
Vermont	0	0	0	------	------	------	18	11	37	0	0	0
Massachusetts	2	5	4	------	------	------	188	227	328	1	8	4
Rhode Island	0	0	0	25	7	------	0	7	38	0	1	1
Connecticut	1	1	1	1	2	1	41	52	66	2	2	2
MIDDLE ATLANTIC												
New York	8	7	9	[1] 1	([1])	[1] 3	84	485	681	18	25	9
New Jersey	4	3	5	2	------	1	34	167	500	3	9	3
Pennsylvania	6	9	9	------	------	------	181	111	211	3	15	6
EAST NORTH CENTRAL												
Ohio	4	5	5	3	2	2	33	38	64	7	7	1
Indiana	6	3	2	3	13	4	18	4	16	3	4	1
Illinois	5	6	12	1	------	2	304	60	228	4	15	1
Michigan [2]	13	7	3	1	------	1	195	146	370	8	9	1
Wisconsin	6	2	1	1	3	9	61	235	593	3	8	2
WEST NORTH CENTRAL												
Minnesota	2	1	1	------	------	------	5	52	52	4	2	0
Iowa	1	2	1	------	------	------	28	14	39	0	2	1
Missouri	4	2	1	3	------	------	24	14	31	2	10	7
North Dakota	1	4	3	------	1	------	1	2	8	0	0	0
South Dakota	1	0	0	------	------	------	5	33	8	1	0	0
Nebraska	3	1	1	2	3	------	7	14	13	1	3	0
Kansas	14	1	2	------	------	------	20	27	53	2	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	0	1	0	1	0
Maryland [2]	4	1	1	1	------	1	8	31	40	2	7	2
District of Columbia	0	0	1	1	------	------	1	24	24	1	2	1
Virginia	2	0	2	38	44	42	6	57	57	3	10	2
West Virginia	3	0	2	32	------	1	0	19	23	4	3	1
North Carolina	9	4	4	------	1	------	17	69	61	0	4	1
South Carolina	4	1	3	49	68	105	12	33	10	2	4	1
Georgia	4	5	3	4	4	7	0	4	20	0	0	0
Florida	3	7	3	------	------	4	1	41	16	3	3	1
EAST SOUTH CENTRAL												
Kentucky	4	1	1	------	------	------	20	16	16	5	4	3
Tennessee	2	3	2	5	8	8	7	11	25	2	2	2
Alabama	3	5	5	6	5	5	2	6	30	7	5	2
Mississippi [2]	7	4	4	------	------	------	------	------	------	3	4	2
WEST SOUTH CENTRAL												
Arkansas	4	4	3	3	18	2	15	38	16	2	2	1
Louisiana	10	2	2	4	2	4	[3] 9	9	9	4	3	1
Oklahoma	0	1	3	7	5	7	8	15	10	1	0	0
Texas	44	24	13	391	203	203	135	237	118	9	4	3
MOUNTAIN												
Montana	2	1	0	1	------	------	4	4	22	0	1	0
Idaho	1	0	1	10	------	------	19	2	3	1	1	0
Wyoming	1	0	0	------	------	------	1	9	12	0	0	0
Colorado	6	4	4	21	4	4	7	27	32	0	3	0
New Mexico	0	0	0	------	------	------	3	4	4	0	0	0
Arizona	2	3	0	14	16	24	8	9	37	1	0	0
Utah [2]	2	0	0	------	1	------	110	21	21	0	0	0
Nevada	0	0	0	------	------	------	0	5	5	0	0	0
PACIFIC												
Washington	3	0	0	------	1	------	92	49	49	2	2	0
Oregon	4	0	2	1	2	4	26	36	36	1	1	0
California	18	22	12	6	7	19	373	641	324	12	17	2
Total	223	151	151	637	421	431	2,133	3,132	4,840	128	205	63
28 weeks	7,119	5,867	6,628	67,692	336,447	167,313	[3] 95,548	583,980	523,593	5,655	12,232	2,143

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Correction: Louisiana, week ended June 23, measles 10 (instead of 60).

Telegraphic morbidity reports from State health officers for the week ended July 7, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis: Week ended— July 14, 1945	Poliomyelitis: Week ended— July 15, 1944	Poliomyelitis: Median 1940–44	Scarlet fever: Week ended— July 14, 1945	Scarlet fever: Week ended— July 15, 1944	Scarlet fever: Median 1940–44	Smallpox: Week ended— July 14, 1945	Smallpox: Week ended— July 15, 1944	Smallpox: Median 1940–44	Typhoid and paratyphoid fever[4]: Week ended— July 14, 1945	Typhoid and paratyphoid fever[4]: Week ended— July 15, 1944	Typhoid and paratyphoid fever[4]: Median 1940–44
NEW ENGLAND												
Maine	1	1	1	11	10	3	0	0	0	0	0	1
New Hampshire	0	3	0	2	0	1	0	0	0	0	0	0
Vermont	1	0	0	4	3	3	0	0	0	0	0	0
Massachusetts	2	2	0	60	84	84	0	0	0	2	3	3
Rhode Island	0	0	0	6	2	2	0	0	0	0	0	1
Connecticut	4	2	2	4	12	12	0	0	0	0	0	0
MIDDLE ATLANTIC												
New York	29	93	3	122	116	113	0	0	0	7	7	7
New Jersey	23	1	0	23	36	36	0	0	0	1	2	2
Pennsylvania	4	31	3	63	73	73	0	0	0	8	5	9
EAST NORTH CENTRAL												
Ohio	10	16	3	57	64	57	0	1	0	8	3	6
Indiana	1	13	8	29	14	14	1	0	0	2	7	7
Illinois	4	16	6	82	49	71	2	0	0	3	2	5
Michigan[3]	1	10	4	117	46	46	1	2	1	11	4	5
Wisconsin	1	3	0	40	31	37	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	0	1	1	29	17	20	0	0	0	0	1	1
Iowa	1	2	2	15	9	10	0	0	0	0	2	1
Missouri	1	1	1	16	6	11	1	0	0	0	4	6
North Dakota	0	1	0	8	5	3	0	0	0	0	0	1
South Dakota	0	0	0	1	7	5	0	0	2	0	0	0
Nebraska	0	0	0	18	3	3	0	0	0	0	0	0
Kansas	5	3	3	21	13	19	0	0	0	0	1	1
SOUTH ATLANTIC												
Delaware	1	0	0	4	1	3	0	0	0	0	0	0
Maryland[3]	3	0	0	19	30	14	0	0	0	2	3	4
District of Columbia	6	0	0	7	12	8	0	0	0	0	2	1
Virginia	7	39	1	19	5	8	0	0	0	3	6	7
West Virginia	3	3	0	9	15	15	0	0	0	4	2	5
North Carolina	2	62	1	7	17	16	0	0	0	[5]3	7	7
South Carolina	11	5	3	4	2	2	0	0	0	9	6	8
Georgia	8	9	2	8	7	4	0	0	0	4	6	15
Florida	1	7	2	2	3	2	0	0	0	4	4	4
EAST SOUTH CENTRAL												
Kentucky	0	66	10	12	7	14	0	0	0	3	7	10
Tennessee	27	7	5	16	12	12	0	0	0	5	6	11
Alabama	6	8	5	11	2	8	0	0	0	5	8	7
Mississippi[3]	2	10	2	11	2	2	0	0	0	2	1	7
WEST SOUTH CENTRAL												
Arkansas	3	2	2	9	1	3	1	0	0	6	6	14
Louisiana	1	11	1	7	3	4	0	0	0	6	17	12
Oklahoma	8	1	1	7	1	3	0	1	0	1	3	8
Texas	45	13	7	32	25	14	0	0	0	22	14	27
MOUNTAIN												
Montana	0	0	0	5	7	7	0	0	0	2	0	0
Idaho	1	0	0	2	6	2	0	0	0	1	0	1
Wyoming	1	0	0	2	4	4	0	0	0	0	0	0
Colorado	1	2	0	11	21	16	0	0	0	1	0	1
New Mexico	0	0	1	2	12	3	0	0	0	0	3	1
Arizona	0	0	0	5	3	1	0	0	0	1	0	1
Utah[3]	0	0	0	6	7	5	0	0	0	2	0	0
Nevada	0	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	5	2	2	16	41	14	0	1	1	0	0	1
Oregon	2	4	1	9	14	6	0	0	0	2	1	0
California	22	12	12	131	114	58	0	0	0	3	4	4
Total	254	462	180	1,101	975	884	6	5	16	133	148	238
28 weeks	1,673	1,752	974	130,156	143,757	93,978	254	278	593	[5]2,004	2,401	2,847

[3] Period ended earlier than Saturday.

[4] Including paratyphoid fever reported separately as follows: Massachusetts 2; New York 3; Michigan 7; South Carolina 1; Georgia 1; Florida 1; Arkansas 1; Louisiana 1; Texas 5; Montana 1.

[5] Correction: North Carolina, week ended June 23, typhoid fever 0 (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended July 14, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— July 14, 1945	Whooping cough: Week ended— July 15, 1944	Whooping cough: Median 1940–44	Week ended July 14, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	50	30	21	0	0	0	0	0	0	0	0
New Hampshire	6	0	1	0	0	0	0	0	0	0	0
Vermont	27	51	16	0	0	0	0	0	0	0	3
Massachusetts	117	73	105	1	0	0	0	0	0	0	0
Rhode Island	19	5	6	0	0	0	1	0	0	0	0
Connecticut	28	49	49	0	0	0	0	0	0	0	3
MIDDLE ATLANTIC											
New York	327	136	265	3	5	0	1	2	0	1	
New Jersey	221	65	142	2	0	0	1	1	0	0	0
Pennsylvania	244	90	265	1	0	0	0	0	0	0	0
EAST NORTH CENTRAL											
Ohio	155	136	224	0	0	0	0	0	0	0	1
Indiana	46	21	30	0	0	0	0	0	0	0	0
Illinois	128	88	157	1	0	0	0	0	1	0	11
Michigan [2]	75	90	250	1	1	0	0	0	0	0	8
Wisconsin	49	88	168	0	0	0	0	0	0	0	3
WEST NORTH CENTRAL											
Minnesota	9	20	64	0	0	1	0	0	0	0	2
Iowa	4	7	44	0	0	0	0	0	0	0	3
Missouri	33	29	33	0	0	0	0	0	0	0	0
North Dakota	0	16	16	0	0	0	0	0	0	0	0
South Dakota	0	22	6	0	0	0	0	0	0	0	1
Nebraska	2	27	24	0	0	0	0	0	0	0	0
Kansas	36	48	63	0	0	0	0	0	0	0	3
SOUTH ATLANTIC											
Delaware	0	0	2	0	0	0	0	1	0	0	0
Maryland [2]	70	98	98	0	0	2	0	1	0	0	0
District of Columbia	12	5	13	0	0	0	0	0	0	0	0
Virginia	115	50	50	1	132	0	0	16	1	0	1
West Virginia	45	10	38	0	0	0	0	0	0	0	0
North Carolina	207	213	213	1	0	0	0	3	0	4	0
South Carolina	66	88	88	0	45	0	0	0	0	2	0
Georgia	15	15	20	1	5	0	0	4	0	31	2
Florida	1	31	13	0	0	2	0	0	0	12	0
EAST SOUTH CENTRAL											
Kentucky	59	17	04	0	2	0	0	1	1	0	0
Tennessee	45	37	48	0	0	6	0	0	0	0	0
Alabama	14	31	31	0	0	0	0	0	0	11	3
Mississippi [2]	------	------	--------	0	0	0	0	0	2	2	4
WEST SOUTH CENTRAL											
Arkansas	18	20	25	11	1	0	0	0	6	0	5
Louisiana	0	0	12	2	0	0	0	0	2	15	2
Oklahoma	21	12	19	0	0	0	0	0	0	0	0
Texas	258	253	210	18	551	10	0	0	1	46	19
MOUNTAIN											
Montana	14	5	10	0	1	0	0	0	0	0	0
Idaho	15	4	14	0	0	0	0	2	0	0	0
Wyoming	1	4	4	0	0	0	0	0	0	0	1
Colorado	44	23	35	0	0	0	0	1	0	0	2
New Mexico	5	2	15	0	0	0	0	0	0	0	0
Arizona	14	14	14	0	0	7	1	0	0	0	0
Utah [2]	35	60	79	0	0	0	0	2	1	0	5
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	20	17	65	0	0	0	0	0	0	0	0
Oregon	22	9	27	0	0	0	0	1	0	0	1
California	231	94	195	0	1	0	5	0	2	0	4
Total	2,923	2,203	3,699	43	744	28	9	35	17	124	96
Same week, 1944	2,203	------	--------	25	1,001	358	11	32	15	141	63
Average, 1942–44	3,362	------	--------	32	652	402	14	[6] 18	20	[6] 58	--------
28 weeks: 1945	70,351	------	--------	926	12,985	3,543	193	204	440	1,822	2,606
1944	51,879	------	--------	851	10,633	3,603	308	237	330	1,643	1,926
Average, 1942–44	90,497	------	[6] 105,735	816	7,394	2,961	292	[6] 237	467	[6] 1,130	--------

[2] Period ended earlier than Saturday.
[6] 5-year median, 1940–44.

Anthrax: Louisiana 1 case. *Psittacosis:* Delaware 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 7, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0		0	1	0	3	0	1	0	0	[illegible]
New Hampshire:												
Concord	0	0		0	0	0	1	0	0	0	0	[illegible]
Vermont:												
Barre	0	0		0	14	0	0	0	1	0	0	[illegible]
Massachusetts:												
Boston	0	0		0	64	0	11	0	20	0	0	2[illegible]
Fall River	0	0		0	0	0	0	0	1	0	0	[illegible]
Springfield	0	0		0	0	0	0	0	5	0	0	[illegible]
Worcester	0	0		0	29	0	6	0	1	0	0	[illegible]
Rhode Island:												
Providence	1	0		0	0	0	4	0	0	0	0	[illegible]
Connecticut:												
Bridgeport	0	0		0	0	0	0	1	0	0	0	[illegible]
Hartford	1	0		0	5	0	1	0	0	0	0	[illegible]
New Haven	0	0		0	0	0	0	2	0	0	0	[illegible]
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	2	0	8	3	1	0	0	[illegible]
New York	9	0	4	0	54	6	0	6	66	0	2	10[illegible]
Rochester	1	0		0	1	0	0	1	5	0	0	[illegible]
Syracuse	0	0		0	0	0	1	0	0	0	0	4[illegible]
New Jersey:												
Camden	0	0		0	21	0	1	0	0	0	0	[illegible]
Newark	0	0		0	5	0	5	1	3	0	0	1[illegible]
Trenton	0	0		0	1	0	1	0	0	0	0	[illegible]
Pennsylvania:												
Philadelphia	1	0	1	1	169	3	16	0	14	0	2	8[illegible]
Pittsburgh	0	0		0	0	0	6	0	8	0	0	[illegible]
Reading	0	0		1	0	0	0	0	5	0	0	[illegible]
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0		0	6	0	4	5	5	0	0	1[illegible]
Cleveland	0	0	1	1	7	6	1	3	10	0	0	2[illegible]
Columbus	0	0	1	1	0	0	0	0	3	0	0	[illegible]
Indiana:												
Fort Wayne	0	0		0	0	0	1	0	0	0	0	[illegible]
Indianapolis	1	0		0	7	0	4	0	2	0	0	[illegible]
South Bend	0	0		0	1	0	0	0	3	0	0	[illegible]
Terre Haute	0	0		0	0	0	2	0	0	0	0	[illegible]
Illinois:												
Chicago	2	0		1	164	7	16	1	33	0	1	3[illegible]
Springfield	0	0		0	0	0	3	0	0	0	0	[illegible]
Michigan:												
Detroit	4	1	1	0	81	3	8	0	23	0	1	1[illegible]
Flint	0	0		0	4	0	0	0	1	0	0	[illegible]
Grand Rapids	0	0		0	0	0	0	0	1	0	0	[illegible]
Wisconsin:												
Kenosha	0	0		0	3	1	0	0	1	0	0	
Milwaukee	0	0		0	11	0	0	0	11	0	0	[illegible]
Racine	0	0		0	0	0	2	0	0	0	0	[illegible]
Superior	0	0		0	4	0	0	0	0	0	0	[illegible]
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0		0	2	1	1	0	2	0	0	[illegible]
Minneapolis	1	0		0	0	0	1	0	7	0	0	
St. Paul	2	0		1	2	0	0	0	3	0	1	
Missouri:												
Kansas City	0	0		0	10	0	3	0	4	0	0	
St. Joseph	0	0		0	0	0	0	0	0	0	0	
St. Louis	0	0	4	0	4	1	7	0	3	0	0	1[illegible]

City reports for week ended July 7, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	0	0	1	0	0	0	0	1
Nebraska:												
Omaha	0	0	------	0	2	0	2	0	9	0	0	2
Kansas:												
Topeka	0	0	------	0	0	0	0	0	4	0	0	0
Wichita	0	0	------	0	3	1	3	0	1	0	0	3
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	2	1	0	0	0	0
Maryland:												
Baltimore	3	0	1	1	6	0	10	2	9	0	0	46
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	1	3	11	0	10	0	0	12
Virginia:												
Lynchburg	0	0	------	0	0	0	0	0	1	0	0	0
Richmond	0	0	------	0	0	0	0	1	3	0	2	4
Roanoke	0	0	------	0	1	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	0	0	0	0
Wheeling	0	0	------	0	1	0	0	0	0	0	1	0
North Carolina:												
Raleigh	0	0	------	0	2	0	1	0	0	0	0	8
Wilmington	0	0	------	0	0	0	0	0	1	0	0	14
Winston-Salem	0	0	------	0	0	0	0	0	5	0	0	13
South Carolina:												
Charleston	0	0	------	0	0	1	0	0	1	0	1	0
Georgia:												
Atlanta	1	0	------	0	0	0	3	3	2	0	0	3
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	3	0	3	0	2	0	0	2
Nashville	0	0	------	1	1	0	2	0	1	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	0	3	3	0	0	1	1
Mobile	0	0	------	1	0	0	1	0	2	0	0	3
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	1	1	0	0	0
Louisiana:												
New Orleans	2	0	2	0	13	2	2	2	1	0	1	0
Shreveport	1	0	------	0	0	0	2	2	1	0	0	0
Texas:												
Dallas	2	0	------	0	1	0	2	4	3	0	0	5
Galveston	0	0	------	0	0	0	0	1	1	0	0	0
Houston	2	0	------	0	0	1	1	2	1	0	0	1
San Antonio	2	0	------	0	0	0	3	0	0	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	0	0	0	0
Great Falls	0	0	------	0	1	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	2	0	3	0	4	0	6	0	0	11
Pueblo	0	0	------	0	0	0	0	0	0	0	0	4
Utah:												
Salt Lake City	0	0	------	0	21	0	1	0	1	0	0	11

City reports for week ended July 7, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	35	0	5	0	4	0	0	4
Spokane	3	0	------	0	6	0	1	1	1	0	0	0
Tacoma	0	0	------	0	24	0	0	0	1	0	0	0
California:												
Los Angeles	1	0	7	0	54	3	0	1	17	0	1	31
Sacramento	1	0	------	0	2	0	1	0	9	0	0	0
San Francisco	0	0	1	0	77	2	5	0	11	0	0	10
Total	43	1	25	9	930	41	187	47	353	0	14	644
Corresponding week, 1944	41	------	10	6	920	------	212	------	367	0	22	490
Average, 1940-44	46	------	25	[1] 9	[2] 1,938	------	[1] 249	------	419	0	25	1,054

[1] 3-year average, 1942-44.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: Newark, 1; Detroit, 1; Nashville, 1.
Dysentery, bacillary.—Cases: New York, 1; Detroit, 1, St. Louis, 2; Charleston, S. C., 18; Nashville, 1; Los Angeles, 4.
Dysentery, unspecified.—Cases: Cincinnati, 34.
Rocky Mountain spotted fever.—Cases: Trenton, 1.
Tularemia.—Cases: New Orleans, 1.
Endemic typhus fever.—Cases: Atlanta, 1; Birmingham, 3; Mobile, 1; New Orleans, 1; Shreveport, 2; Dallas, 1; Houston, 1; San Antonio, 1; Winston-Salem, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population), 1943, 34,156,200

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	0.0	0.0	295	0.0	68.0	7.8	76	0.0	0.0	94
Middle Atlantic	5.1	0.0	2.3	0.9	117	4.2	17.6	5.1	47	0.0	1.9	127
East North Central	4.3	0.6	1.8	1.8	175	10.3	24.9	5.5	57	0.0	1.2	76
West North Central	6.0	0.0	8.0	2.0	46	6.0	35.8	0.0	66	0.0	2.0	52
South Atlantic	7.1	0.0	1.8	1.8	21	7.1	47.7	12.4	58	0.0	7.1	177
East South Central	0.0	0.0	0.0	11.8	24	0.0	53.1	17.7	30	0.0	5.9	35
West South Central	25.8	0.0	5.7	0.0	40	8.6	31.6	34.4	23	0.0	2.9	17
Mountain	7.9	0.0	15.9	0.0	199	0.0	39.7	0.0	56	0.0	0.0	207
Pacific	9.5	0.0	12.7	0.0	313	7.9	19.0	3.2	68	0.0	1.6	71
Total	6.6	0.2	3.8	1.3	142	6.3	28.6	7.2	54	0.0	2.1	99

PLAGUE INFECTION IN SAN BENITO COUNTY, CALIF.

Plague infection has been reported proved, on July 5, in a pool of 200 fleas from 57 ground squirrels, *C. beecheyi*, the same from which fleas were also proved plague-infected on June 22, shot 7 miles east and 3 miles south of Tres Pinos, San Benito County, Calif.; also, on July 5, in a pool of 204 fleas from 59 ground squirrels, *C. beecheyi*, shot on a ranch 5 miles east of Tres Pinos.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 23, 1945.—During the week ended June 23, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		71	1	152	382	79	38	107	92	922
Diphtheria		2	2	15	3	2				24
Dysentery: bacillary				5						5
German measles		20		6	134	3	2	45	19	229
Influenza		8			36				7	51
Measles		11	2	92	137	17	28	123	219	629
Meningitis, meningococcus					3		2	1		6
Mumps		3		87	91	45	31	94	26	377
Poliomyelitis		1						1		2
Scarlet fever		1	8	49	50	9	4	25	24	170
Tuberculosis (all forms)		4	2	101	13	21	17	10	57	225
Typhoid and paratyphoid fever				17	1					18
Undulant fever				3						3
Venereal diseases:										
Gonorrhea		19	5	137	141	37	36	25	71	471
Syphilis		20		114	71	3	9	6	30	253
Whooping cough		4		58	28		1	19	9	119

JAMAICA

Notifiable diseases—4 weeks ended June 30, 1945.—During the 4 weeks ended June 30, 1945, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	15	37	Leprosy		2
Diphtheria	1	6	Tuberculosis (pulmonary)	16	58
Dysentery (unspecified)	8	5	Typhoid fever	7	101
Erysipelas	4		Typhus fever	2	2

NEW ZEALAND

Notifiable diseases—4 weeks ended June 16, 1945.—During the 4 weeks ended June 16, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	8		Poliomyelitis	2	
Dengue	1		Puerperal fever	8	
Diphtheria	160	5	Scarlet fever	561	2
Dysentery:			Tetanus	2	
Amebic	6		Trachoma	2	
Bacillary	20		Tuberculosis (all forms)	185	37
Erysipelas	32	1	Typhoid fever	2	
Malaria	14		Undulant fever	1	

PERU

Notifiable diseases—Year 1944.—During the year 1944, cases of certain notifiable diseases were reported in Peru as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	40	Recurrent fever	132
Diphtheria	1,021	Scarlet fever	500
Dysentery, unspecified	7,047	Smallpox	296
Encephalitis	18	Syphilis	5,738
Gonorrhea	8,129	Tuberculosis	18,054
Influenza	28,537	Typhoid fever	3,067
Leprosy	138	Typhus fever	1,466
Malaria	95,349	Undulant fever	866
Measles	5,895	Veruga peruana	853
Plague	83	Whooping cough	25,678
Poliomyelitis	45		

NOTE.—For reports for the years 1939–43 see page 1074 of the PUBLIC HEALTH REPORTS of Aug. 11, 1944.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

China—Szechwan Province.—For the period June 5–25, 1945, cholera was reported in Szechwan Province, China, as follows: Chungking municipality, 8,000 cases, 114 deaths; Nekiang, 200 cases, 122 deaths; Pishan, 40 cases, 5 deaths.

Plague

Argentina.—During the month of May 1945, 1 death from plague was reported in Campo Verde, Santiago del Estero Province, Argentina. For the same period plague infection was reported in 2 rats found in Port Quequen, Buenos Aires Province.

Egypt.—For the week ended June 9, 1945, 16 cases of plague with 2 deaths were reported in all of Egypt. For the week ended June 30, 1945, 12 cases of plague with 4 deaths were reported in Port Said, Egypt.

Typhus Fever

Algeria.—For the period June 1–10, 1945, 51 cases of typhus fever, including 15 cases in Algiers and 27 cases in Tenez, were reported in Algeria.

Bolivia.—For the month of May 1945, 61 cases of typhus fever with 17 deaths were reported in Bolivia. Departments reporting the highest incidence are as follows: La Paz, 23 cases, 11 deaths; Oruro, 15 cases, 3 deaths; Potosi, 14 cases, 1 death.

Chile.—For the period April 22 to May 19, 1945, 59 cases of typhus fever with 4 deaths were reported in Chile. Provinces reporting the highest incidence are as follows: Osorno, 17 cases; Concepcion, 12 cases.

Egypt.—For the week ended June 9, 1945, 476 cases of typhus fever with 58 deaths were reported in Egypt.

Union of South Africa.—For the month of March 1945, 106 cases of typhus fever with 10 deaths were reported in 9 inland districts of the Union of South Africa.

Yellow Fever

Brazil.—Deaths from yellow fever have been reported in Brazil as follows: Goiaz State—Rio Verde, May 1, 1; Minas Geraes State—Campina Verde, May 21–23, 2, Frutal, May 8, 1, Ituiutaba, April 23, 1, Paracatu, April 27, 1, Pirajuba, May 3, 1, Santa Vitoria, April 22, 1, Sao Francisco de Sales, April 16, 1.

Venezuela.—In the municipality of La Grita, Jauregui district, Tachira State, Venezuela, 3 fatal cases of yellow fever (confirmed by viscerotomy) were reported near the following villages: El Carmen, June 19, 1, Morotuto, June 20, 1, Omuquena, June 17, 1. A report dated July 13, 1945, states that 1 confirmed case of yellow fever was reported in the municipality of La Libertad, Perija district, Zulia State, Venezuela.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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TESTS OF THE EFFECTIVENESS OF DDT IN ANOPHELINE CONTROL[1]

By S. W. SIMMONS, *Sanitarian (R)*, and Staff, *United States Public Health Service*

The return of troops with malaria to anopheline-infested areas in this country creates an urgent need for improved methods of malaria control. This rapidly growing problem is superimposed on that of continued protection of troops in hyperendemic combat areas. In meeting these problems the use of the chemical commonly known as DDT (2,2-bis(parachlorophenyl) 1, 1, 1-trichloroethane) is indicated to be an improvement of the first magnitude.

Work was recently initiated at the Henry Rose Carter Memorial Laboratory in Savannah, Ga., to develop practical working information, procedures, materials and equipment for use on the Malaria Control in War Areas program. Determination of the effectiveness and practicability of DDT in the control of anopheline mosquitoes is a major phase of the work. At the outset, data previously secured by other workers was drawn on heavily as a foundation. Information secured from reports and personal conferences with workers from the Orlando, Fla., laboratory of the Bureau of Entomology and Plant Quarantine, the National Institute of Health, and various contractors with the Office of Scientific Research and Development has been particularly helpful.

The work on DDT in mosquito control has fallen into two principal categories: First, its use as a residual house spray, and secondly, its use as a larvicide. As a larvicide DDT is distinctly promising but results from its use as a residual spray are spectacular. No other material has been shown to impart lethal effects to sprayed surfaces over a period of time comparable to that obtained with DDT. It is this ability, when conjoined with established mosquito control practices, that has caused malariologists to conceive the practicability of malaria eradication.

[1] From Malaria Control in War Areas, States Relations Division. This paper was submitted for publication on November 10, 1944, and was scheduled to appear in the November 24, 1944, issue of PUBLIC HEALTH REPORTS. Because of the subject matter the paper was witheld from publication at that time. The article is a summary of work conducted by the following officers of the U. S. Public Health Service. E H Arnold, Passed Assistant Engineer (R), R. W. Fay, Assistant Sanitarian (R), F. F Ferguson, Assistant Sanitarian (R), W A. Moore, Passed Assistant Sanitarian (R), S. W. Simmons, Sanitarian (R), R. L. Stenburg, Assistant Engineer (R), Harry Stierli, Assistant Engineer (R), C. M. Tarzwell, Passed Assistant Sanitarian (R), and W. M Upholt, Assistant Sanitarian (R).

DDT AS A RESIDUAL ADULT SPRAY

The high toxicity, low volatility, and adhesion of the crystals of DDT on treated surfaces are factors contributing to its effectiveness as a residual house spray.

Field investigations.—In field tests vacant and occupied houses were sprayed and the effect on the intramural mosquito population determined. The windows of the houses were fitted with two types of traps; the first permitted the entrance of wild adult mosquitoes but captured them when they attempted to escape, the second was an outlet trap only, and doors were left open for the entrance of mosquitoes. In other tests, adults of *Anopheles quadrimaculatus* were released in rooms equipped only with outlet window traps. In general, the window trap catches consisted of adult mosquitoes which had received a minimum exposure, since the majority, receiving longer exposures were knocked down before they could reach the traps.

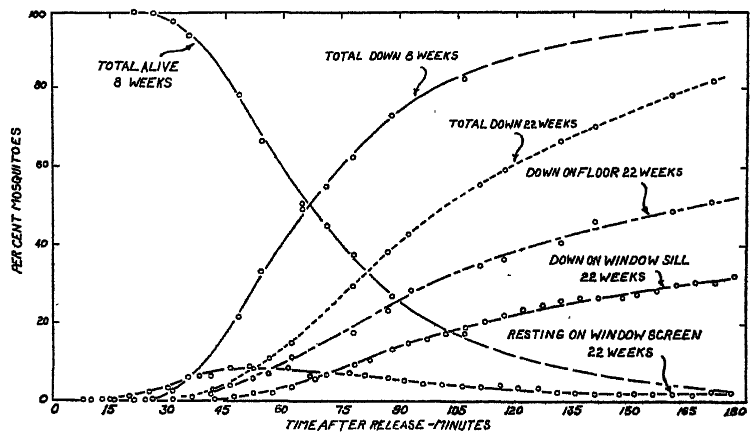

FIGURE 1.—Morbidity of *A. quadrimaculatus* released in rooms treated with 200 mg. per square foot DDT dosages, 8 and 22 weeks after treatment. Room temperature, 29° C.

Four unoccupied rooms treated with 100, 200, 400, and 800 mg. of DDT per square foot were giving 100 percent kills after periods of 6 to 8 weeks, while one room with a 200 mg. per square foot dosage, was still effecting a complete kill 22 weeks after treatment. A 55-percent longer exposure time was necessary to obtain a 50-percent knockdown of mosquitoes exposed in rooms treated for 22 weeks as compared with those treated for only 8 weeks, at 200 mg. per square foot dosages. All results were balanced against checks, in which very little mortality occurred. To date 17 paired releases have been made involving 600 to 2,000 mosquitoes per room for each release.

The behavior pattern and morbidity of *A. quadrimaculatus* released in a treated room is illustrated in figure 1. When first released mosquitoes rest quietly on the walls and ceilings, no direct repellency reaction being noted. After 5 to 10 minutes they become sufficiently

irritated so that they begin a downward migration from the ceiling to the lower walls. Flight sounds begin at this time and increase in intensity until knockdown is 25 to 50 percent complete. Specimens most affected begin to move toward the light within 5 to 10 minutes after release. The first knockdown usually occurs in 8 to 18 minutes, with knockdown largely complete in 30 to 90 minutes. A few resistant adults may, however, still remain after 2 to 5 hours. These figures vary considerably depending upon temperature and the age of the treatment.

Once mosquitoes are knocked down there is very little apparent recovery. Mortalities after 24 hours are practically always greater than the knockdown recorded at the end of each test.

A vacant house with paper-covered plasterboard walls was treated April 19 with a kerosene-DDT solution at the rate of 200 mg. of DDT per square foot, and the weighted mortality of trapped mosquitoes held for 48 hours averaged 75 percent during July and 66 percent during August. In a house with wood walls, treated April 22 with a xylene emulsion at the same rate, the respective kills for the same periods were 90 and 87 percent. Many mosquitoes died in the rooms before reaching the traps. In 6 days 1,438 dead mosquitoes were picked from the floor of one 9- by 11-foot treated room, whereas almost no mortality occurred in untreated rooms.

The average weighted mortality of trapped mosquitoes from several unoccupied houses was 60 to 70 percent, 20 weeks after treatment. This may indicate that one treatment per season would suffice in the more northern malarial zones of this country, but two treatments may be desirable in the southern zones.

Death rates in some 50 occupied houses were lower than in unoccupied ones. The weighted death rate of mosquitoes caught in window traps during August, from houses treated in June, was only about 30 percent. Actual rates were higher than this, however, since those mosquitoes that died in the rooms before reaching the traps were not recovered.

The most important factor reducing mortality in occupied houses is the large proportion of untreated resting surfaces, such as furniture, bedding, and exposed wearing apparel. Such materials as exposed clothing are removed during treatment of the house but when returned offer safe resting places for mosquitoes. When possible, therefore, treatment of household effects is advised to enhance the effectiveness of mosquito control.

Tests have been conducted with several satisfactory DDT residual spray formulae. The one checked most thoroughly was DDT, 35 percent, and Triton X-100, 4 percent in xylene, Duponol OS at a 4-percent concentration, or the water-soluble Arctic Syntex A at a concentration of 0.5 percent are also satisfactory emulsifiers. This

concentrated solution is added to 6 parts of water to give a 5-percent DDT spray. The emulsion is quite stable and remains unbroken without agitation for 2½ hours or longer, and is satisfactory for use in small type sprayers without agitators. When applied at the rate of 4 cc. of spray per square foot of surface area to rough absorptive walls no damage occurred. Less absorptive walls, such as finished wood, may be treated with a 10-percent DDT emulsion at the rate of 2 cc. per square foot. If a power sprayer with adequate agitation is used almost any emulsifier will suffice. With hand sprayers, an emulsifier producing a stable emulsion should be selected.

At present prices the average tenant house of 1,700 square feet of wall and ceiling surface can be treated at a cost of about $1.50 to $1.75 with the DDT-xylene-Triton-water emulsion at the rate of 200 mg. of DDT per square foot of surface area. This includes labor, materials, and a 10-percent overhead allowance, but does not include the capital outlay for automotive or other heavy equipment. At present, material costs alone average about one-half the total cost of treatment. This low cost method of mosquito suppression, if used in conjunction with conventional procedures, should effect a degree of malaria control not heretofore obtainable.

A field method for determining toxicity of treated surfaces.—A technique for determining the toxicity of treated walls at stated intervals after treatment would be of considerable practical value, and a method has been devised that has some promise of fulfilling this need.

Mosquitoes are exposed to the treated surface for a definite period of time, ordinarily 30 minutes. A small wire or glass cage about 3 inches in diameter and ½ inch deep is used to confine the mosquitoes over the treated wall surface. After exposure, specimens are held and the mortality recorded at 24 and 48 hours. Six separate simultaneous exposures have been made in each treated room tested, along with 6 check exposures on untreated surfaces. An average of 15 specimens was used for each individual test and results are based on weighted kills 48 hours after exposure, when balanced against the control tests. Experiments conducted have been with wild specimens, mostly engorged females.

In most instances houses tested in this manner were treated with a power sprayer at the rate of 4 cc. of spray per square foot of surface area. In a few cases a hand-operated pressure sprayer was employed. Table 1 is an example of some preliminary results obtained.

The mortality of mosquitoes exposed to ceilings has been greater than those exposed to comparable treated walls. Observations indicate that *A. quadrimaculatus* prefer, under such conditions, to rest on a horizontal rather than vertical surface, and thus a better exposure is secured with the ceiling tests.

TABLE 1.—*Results of exposure for stated periods of* A. quadrimaculatus *adults to walls treated with specified doses of DDT*

Dosage (mg. per square foot)	Solvent	Type wall surface	Occupancy	Age after treatment (weeks)	Exposure time (minutes)	Net mortality (percent) on—	
						Walls	Ceilings
100	Xylene	Unpainted fibre board	Unoccupied	2	30	90	-------
150	Pine oil (sulphonated)	Painted plasterboard	do	14	30	63	100
200	Xylene	Rough boards	Occupied	10	30	[1]48-74	[1]89-100
200	do	Painted wood	Unoccupied	14	30	74	100
200	do	Calcimined plaster	do	14	30	61	-------
200	do	Calcimined plasterboard.	do	20	15	60	100
288	do	Rough boards	Occupied	8	30	61	100
288	do	Newspaper	do	8	30	77	100
385	do	Rough boards	do	8	30	80	-------
385	do	Newspaper	do	8	30	98	-------
800	do	Calcimined plasterboard.	Unoccupied	2	30	89	100

[1] Range of mortalities obtained with tests in 2 different houses.

Five of the tests in table 1 were conducted in occupied houses and six in unoccupied ones. No consistent differences in actual wall toxicity were obtained. Both wood and plasterboard walls are represented, but comparative evaluation of results on different surfaces should await further tests over longer periods of time. A good residual effect was obtained on old painted walls, but DDT on freshly painted surfaces does not give comparable results, even failing to crystallize on very recently painted surfaces.

In these tests specimens were confined to the wall surface, but nocturnal observations of specimens in a room, using a cow as a host, showed that *A. quadrimaculatus* normally rest on walls a sufficient time to obtain a lethal dose of DDT. Some engorged specimens were observed to remain on untreated walls from 8:30 p. m. to 7 a. m. without moving. Other specimens shifted, but practically all remained on the walls overnight, and even during the following day. On treated walls, mosquitoes moved when irritation began but usually alighted on some other treated place within the building. None were noted to rest for as long as one-half hour, and all showed effects of the DDT, many being knocked down in less than 30 minutes.

Laboratory investigations.—Four wooden panels, 3 x 12 inches, treated either in the laboratory or in the field, were fitted into a wooden frame to make a standard exposure chamber. Known numbers of adults, usually 20, of *A. quadrimaculatus* were introduced into the test chamber by a buoyant air current, and held for exposures ranging from 25 minutes to 4 hours. Mortality readings were taken in untreated holding cages at 24-, 48-, and 72-hour intervals after treatment and results balanced against controls. To date 33,000 specimens, both wild and insectary reared, have been exposed in a series of 1,800 individual tests.

To determine the relationship between exposure time and mortality, series of pine plywood panels were treated with a standard DDT-xylene-water emulsion at rates of 50, 100, 200, and 300 mg. of DDT per square foot of surface area. The minimum exposure time necessary for a 100-percent mortality at varying intervals after treatment was determined. In brief, a 100-percent mortality was obtained by a 45-minute exposure to a 200 mg. per square foot panel 1 week after treatment, by 60-minute exposure 2 weeks after treatment, by 90-minute exposure 1 month after treatment, and by 120-minute exposure 2 months after treatment.

In these tests exposure time was prolonged to kill the small percentage of resistant specimens. This is demonstrated by the fact that 10 weeks after treatment a 35-minute exposure gave an 84-percent mortality, a 60-minute exposure gave 89 percent, and a 120-minute exposure gave 94 percent.

A series of wood panels was sprayed in the laboratory with mixtures of DDT and xylene, in kerosene and in pine oil. The xylene

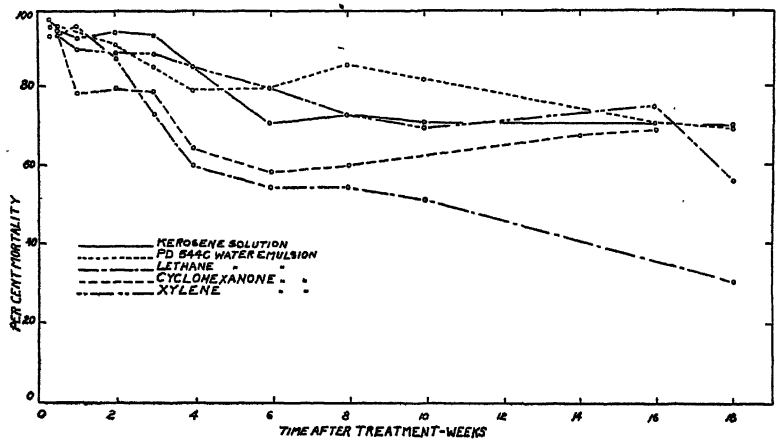

FIGURE 2.—Comparative mortalities of *A. quadrimaculatus* 48 hours after exposure for 30 minutes to 200 mg. per square foot residual doses of DDT in specified solvents.

and kerosene mixtures after 18 weeks with a 60-minute exposure at 200 mg. per square foot concentration, gave a kill of approximately 80 percent, while the pine oil mixture gave a 60-percent kill.

Kerosene base sprays are about as effective as xylene sprays but the action of the DDT is somewhat delayed, and results 24 hours after exposure usually show the xylene to kill more rapidly. PD544C, a light proprietary oil which will dissolve about 35 percent DDT, has shown results somewhat comparable to xylene. Figure 2 illustrates some of the differences encountered with the use of different solvents.

The form, penetration, and effectiveness of DDT deposits on the test chamber panels vary with the type of solvent used. Solvents such as kerosene give long, fragile, needle-shaped crystals, usually

radiating from a central nucleus. Crystals from emulsions with such solvents as xylene and cyclohexanone are also needle-shaped but smaller. A relatively less fragile, compact, fan-shaped, crystalline mass is ordinarily obtained from emulsions with pine oil or orthodichlorobenzene as solvents. Thanite and Lethane emulsions give amorphous-like deposits. Apparently the solvent forms a dry surface film which greatly inhibits crystal formation, and such deposits exhibit less prolonged toxicity, due probably to the protective solvent film present. Deposits from other solvents tested have, in general, fallen into one or another of the above categories.

Within a limited range the density of DDT makes very little difference in laboratory effectiveness, for after 10 weeks at a 50 mg. per square foot concentration the mortality was 70 percent with a 60-

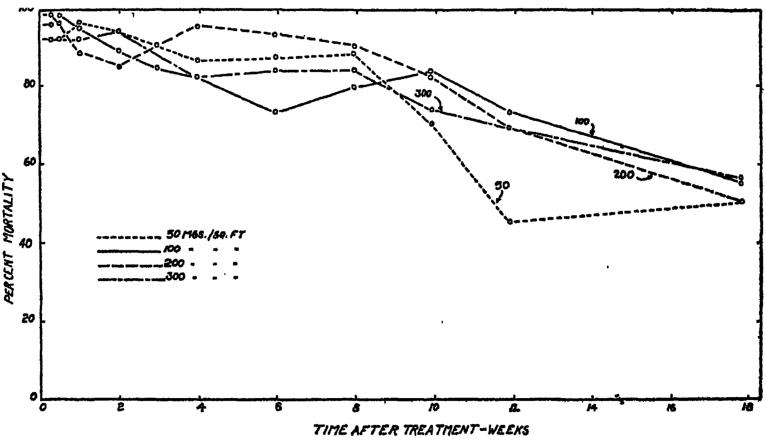

FIGURE 3.—Comparative mortalities of *A. quadrimaculatus* 48 hours after exposure for 60 minutes to specified residual doses of DDT applied as a xylene-water emulsion.

minute exposure, at 100 mg. per square foot it was 83 percent, at 200 mg. per square foot it was 82 percent, and finally at 300 mg. per square foot the death rate was 74 percent (fig. 3). Recent tests have indicated, however, that the 50-mg. dose loses toxicity sooner than doses of 100 mg. or more, particularly in the field.

Tests on the weathering resistance of residues have shown that the mechanical action of rain is the most important deteriorating factor. Panels exposed to 14 inches of rainfall over a 4-week period killed only 25 percent of mosquitoes exposed for 30 minutes, as compared with 75 percent on panels maintained inside the laboratory and 65 percent on panels exposed daily to direct sunlight only.

DDT AS AN ANOPHELINE LARVICIDE

Malaria Control in War Areas performs larviciding operations in some 25 States, usually by the application of oil with knapsack or similar type sprayers, at the rate of 15 to 20 gallons of material per

acre treated. Preliminary work has been conducted on the feasibility of substituting a DDT spray for the oil without radically changing the technique of application in which laborers are already trained.

There has been no marked deviation from standard field practices in larval sampling, or checking results of treatment. Solutions used are emulsified in water before treatment, so that the total amount of spray applied is in the neighborhood of 15 to 20 gallons per acre. Solvents without DDT are tested for toxicity by application to check plots. Control and experimental plots are normally checked at 24 and 48 hours after treatment and at as frequent intervals as necessary thereafter to ascertain the duration of the treatment. Water samples are taken before and after spraying for laboratory examination, where more critical studies are made of field experiments to determine duration of toxicity and dosage mortality.

At the present time the following types of application are under study:

1. *Surface films.*—These consist of DDT dissolved in some lighter than water solvent such as kerosene or fuel oil plus an emulsifying-spreading agent. A type formula is 1.25 percent DDT, 0.5 percent B–1956 (an emulsifying-spreading agent) in No. 2 fuel oil. One gallon of this DDT concentrate is mixed with 15 to 20 gallons of water at the site of treatment and applied at the rate of 1 gallon of concentrate per acre, by means of knapsack sprayers. This dosage (0.1 pound DDT per acre), as recommended by the Bureau of Entomology and Plant Quarantine, gave excellent control on a variety of areas containing dense floating, submerged, and emergent vegetation. Reduction in the amount of solvent resulted in a slightly less effective application.

2. *Emulsions.*—These consist of DDT in some solvent plus an emulsifier. A type formula is DDT 35 percent in xylene, with Triton X–100, Duponol OS, or comparable emulsifiers. The DDT concentrate is emulsified in water so that the total application is about 15 to 20 gallons per acre. This stable emulsion has given excellent control at 0.1 pound of DDT per acre, volume concentrations being between 1 part in 14 million to 1 part in 20 million. Presumptive evidence indicates that it is more harmful to other aquatic insects than the fuel oil-DDT surface film applications.

Xylene is only one of several satisfactory solvents that may be employed. Gas liquor, or condensate (*1*), a byproduct from the destructive distillation of coal in the manufacture of cooking and heating gas, will dissolve as much as 90 gm. of DDT per 100 cc. of liquid. This material is available at most municipal gas plants, and its pre-war price average about 6 cents per gallon. Excellent results were obtained with this material when used as a solvent for DDT in larviciding.

3. *Suspensions.*—Those tested have been made by dissolving DDT in a water miscible solvent such as alcohol, and adding to water with a dispersing agent. This material, applied at rates similar to the emulsions, has given comparable results.

Experiments indicate that DDT properly applied will kill all anopheline larval stages within 24 hours at a dosage of 0.1 pound per acre. Tests on emulsions indicate that 90 to 95 percent of the kill takes place within the first hour after treatment. Field samples taken from the surface of a pond treated with the DDT-xylene-Triton

emulsion at the rate of 1 p. p. m. gave 100 percent mortality up to 24 hours. After 48 hours the kills ranged from 30 to 40 percent and after 4 days no surface toxicity was apparent. Laboratory tests with 5 percent DDT in No. 2 fuel oil applied at the rate of 15 gallons per acre, showed that samples taken 2 inches below the surface, without disturbing the surface film, were nontoxic to larvae up to 24 hours after treatment. Samples taken 4 days after treatment, however, produced 100 percent mortality in 24 hours. Application of 1.25 percent DDT in fuel oil, applied at the rate of 0.1 pound of DDT per acre, showed no subsurface mortality during the first 5 days after treatment. Five to eight days after treatment subsurface toxicity was present.

Time-mortality curves for DDT in No. 2 fuel oil at dosages greater than 0.02 p. p. m. are typically sigmoid. Curves for dosages between 0.02 p. p. m. and 0.2 p. p. m. at 26° C. to 28° C. lie very close together with the critical regions between 1½ and 4 hours, and the steepest points on the curve at 30 to 40 percent mortality.

Time-morbidity data follow similar, though steeper, curves with the critical regions lying between 15 minutes and 2 hours.

No pupal mortality has been noted in the field tests. In the laboratory 80 percent of *A. quadrimaculatus* pupae, not more than 24 hours old at the beginning of the test, emerged from water containing 1 p. p. m. of DDT, which was equally as great emergence as occurred from the check. A high mortality was obtained at a 4 p. p. m. DDT concentration with pupae not more than 5 hours old, but in this instance an equivalent amount of xylene solvent produced equally lethal results.

DDT in the concentrations and combinations applied seems to have virtually no effect on most of the plankton organisms and a relatively large number of the somewhat larger forms such as *Daphnia*. It is too early as yet, however, to say that there is no accumulated effect. No damage to fish life has been observed at concentrations of one-tenth pound of DDT per acre. Volume applications in the field at the rate of 1 p. p. m. have killed pike, warmouth bass, bream, catfish, and gambusia.

Observations have shown an apparent lack of residual properties of DDT in larviciding, although some lengthening of the necessary larviciding interval has been noted. Laboratory work indicates that DDT is inactivated by the bottom mud complex. A DDT emulsion at ¼ p. p. m. in laboratory containers with mud from the bottom of a pond had a relatively rapid reduction in toxicity, giving only a 45-percent mortality on the third and fourth days, even after 48 hours' exposure. A xylene-DDT-syntex emulsion at a concentration of ¼ p. p. m. lost its effectiveness in less than 5 days in the presence of bottom mud, while in clean laboratory glassware an 80-percent

mortality was obtained even after 14 days. The addition of clean sand, or aquatic plants such as *Utricularia,* to the DDT failed to reduce appreciably its toxicity. The nature of this inactivating process is not known. It is not believed that it is due to a simple settling-out process since bottom mud from treated ponds or laboratory containers has not shown toxicity when agitated in the presence of larvae.

DDT is easily applied as a larvicide with existing equipment without appreciable modification, and the cost of materials is less than one-fifth that of fuel oil. Labor cost involved is approximately the same as for oiling.

It may be summarily stated that the work described is of a preliminary nature. A final definition on the toxic properties and use of DDT presents a striking challenge to all who are interested in malaria control.

SUMMARY

The average tenant house can be treated with a DDT residual spray at a cost of about $1.50 to $1.75, including labor, materials, and overhead, but exclusive of initial outlay for heavy equipment. The spray can be applied either with a hand-pressure sprayer or with a power machine, and at a dosage of 200 mg. of DDT per square foot of surface area has effected a 60- to 90-percent mortality of wild mosquitoes in unoccupied houses 20 weeks subsequent to treatment. A residual toxicity of this duration suggests that one treatment per year might be sufficient in the more northern malaria zones of this country, but two treatments will probably be required in the southern zones.

Residual sprays do not give as effective a kill in occupied houses, not because of lack of toxicity, but due to the large proportion of untreated resting places such as furniture, bedding, and exposed wearing apparel. Treatment of household effects is advised where practical.

Treated wood surfaces exposed to 14 inches of rainfall over a period of 4 weeks effected a 25-percent kill compared with a 75-percent kill obtained from control panels. Sunlight alone caused a reduction in toxicity of 10 percent over the same period.

Apparatus and methods for a critical bio-assay of the lethal effectiveness of treated surfaces both in the laboratory and field are described and illustrated. When applied as a spray at the rate of one-tenth pound of DDT per acre essentially 100-percent larva kills were obtained. According to the solvent and spreading or emulsifying agent employed, applications may be made as a surface film treatment, a stable emulsion, or as a suspension. No appreciable residual toxicity to larvae has been noted, and laboratory tests have shown that bottom mud inactivates the DDT. Distribution of the DDT-

laden mud throughout the water has failed to restore toxicity, which suggests that the DDT actually combines with or adheres to components of the mud.

Materials for effective larviciding with DDT cost less than one-fifth as much as a comparable effective application of fuel oil.

REFERENCE

(1) Simmons, S. W., and Dove, W. E.: Experimental use of gas condensate for the prevention of fly breeding. J. Econ. Ent., 38: 23–25 (1945).

MEETING OF THE NATIONAL ADVISORY HEALTH COUNCIL

The National Advisory Health Council met at Public Health Service headquarters in Bethesda, Md., on June 19 and 20, 1945.

The 2-day session was devoted to discussion of the current and future activities of the several bureaus.

Surgeon General Parran, in opening the meeting, called attention to the legal functions now vested in the National Advisory Health Council under the provisions of the Public Health Service Act of 1944 (Public Law No. 410). Before the passage of this law, the Council served solely in an advisory capacity. The Council now has the responsibility to:

1. "* * * advise, consult with, and make recommendations to the Surgeon General on matters relating to health activities and functions of the Service;" and to serve in other capacities as requested.

2. Recommend research projects for grants-in-aid in scientific fields other than cancer research, and recommend other procedures for the advancement of scientific research.

3. Recommend the adoption of regulations by the Service with respect to interstate quarantine for the prevention of communicable diseases, including regulations for the apprehension, examination, and detention of persons who are spreading disease.

The programs of the Sanitary Engineering Division, the Bureau of Medical Services, and the Bureau of State Services were discussed on the first day. On the second day, a proposed plan for training of Public Health Service personnel was presented by the Division of Public Health Methods; the Nurse Education Division presented proposals for the postwar nursing program; and the work of the National Institute of Health was discussed.

The Council recommended the approval of a grant-in-aid of $92,000 to the University of Utah for research on muscular dystrophy. This is the first grant-in-aid for general research projects to be made under the provisions of Public Law No. 410.

Among other important decisions of the Council were recommendations that—

1. A committee of the Council be appointed to act with designated officers of the Service in the development of a program of clinical research.

2. The Public Health Service strengthen its control of the interstate spread of disease through consultant services to public health laboratories and through maintenance of a $1,000,000 emergency fund to be used in epidemics and disasters.

3. The Public Health Service undertake demonstrations in selected communities of generalized public health nursing programs, including bedside care.

4. The Public Health Service establish a training program for its own personnel, which would include orientation, work experience, observation, in-service training, and opportunities for State and local personnel to participate.

5. The program of grants-in-aid and technical services to the States in the field of industrial hygiene be expanded.

6. The Public Health Service seek appropriations for grants-in-aid for general research to be allotted to qualified institutions and individuals.

7. When the Federal Government undertakes grant-in-aid programs related to public health and sanitation, the Public Health Service be empowered to conduct investigations for determination of the nature and extent of the problem involved and to approve the allocation of funds, functional effectiveness, and placement of plants, installations, and constructions required of such programs.

In addition, the Council approved the policy of the Public Health Service on national programs for the control of water pollution.

Regular meetings of the Council will be held twice a year; special meetings will be called as needed. Council members are to serve as chairmen of special committees dealing with specific subjects.

RECOMMENDATIONS

The Council recommended that:

1. The Council meet twice a year—

(a) Special meetings be held as Council members determine.

(b) Members serve as chairmen of special committees dealing with specific subjects.

(c) Digests of Public Health Service activities be sent monthly to Council members.

(d) The Council be kept informed of the work of all advisory committees and councils.

2. The Public Health Service engage in clinical investigation on significant problems arising among the beneficiaries of the Service—

(a) A committee of the Council be appointed to act with Public Health Service officers designated by the Surgeon General to develop a program of clinical investigation within the Service.

3. The Public Health Service undertake to evaluate various diagnostic and analytic procedures used in public health laboratories, with a view to providing consultant services to the laboratories for improvement of their performance—

(a) A staff of consultants, especially trained in the diagnosis, management, and control of communicable diseases be maintained for service to the States.

4. The distribution and redistribution of infectious material imported to the United States for research work under authority of the Public Health Service (sec. 361a—Public Law No. 410) require the permission of the Surgeon General.

5. The Public Health Service maintain a fund of not less than $1,000,000 for use, under appropriate safeguards, during epidemics or disasters threatening public health.

6. The Public Health Service undertake in selected communities the study and demonstration of generalized public health nursing programs, including bedside care.

7. The Public Health Service recommend to the Central Committee of the American Red Cross the adoption of a policy whereby Red Cross nursing personnel would be integrated with the personnel of local health departments in a generalized community nursing program.

8. The Tuberculosis Control Division of the Public Health Service develop a program of—

(a) Field studies to evaluate and promote the use of new diagnostic and treatment methods.

(b) Research on the application of electronics to radiology; this work to be carried on in cooperation with other agencies and commercial organizations working in the field.

(c) Cooperative projects with the various scientific groups and universities throughout the United States in order to avoid duplication of research in tuberculosis control.

9. Operation of the Rapid Treatment Centers of the Venereal Disease Division be continued in the postwar period, with such administrative adjustments as developments may warrant.

10. The Public Health Service undertake studies of the treatment and management of asymptomatic neurosyphilis, provided these studies do not interfere with the primary public health responsibility to find and treat cases of infectious syphilis.

11. The Public Health Service establish a training program and facilities with competent full-time staff who will be given long-term assignments for the purpose of developing programs of general and special education and training for personnel of the Public Health Service. These programs should—

(a) Include orientation, work experience, observation, and in-service training.

(b) Provide opportunities for training State and local health personnel.

12. As a part of its training program, the Public Health Service develop an assignment policy which would realize the maximum potentialities of its officers. The Council recognizes that exigencies at times may determine assignments, but an effort should be made to develop officers specialized in the various Public Health Service functions. This can be accomplished only through adequate work experience in the individual officer's field, in addition to formal training. In the clinical fields, such a policy would lead to qualification for certification by the appropriate specialty boards.

13. The Public Health Service, under authority of Public Law No. 410 (sec. 314c)—

(a) Offer reserve commissions to faculty members of schools of public health.

(b) Afford such personnel an opportunity periodically for active duty and new field experience in their specialties.

14. The Public Health Service analyze the work performed by various categories of public health personnel, and the results of these analyses be made available—

(*a*) To schools of public health for use in curricula revision.

(*b*) To accrediting agencies and other groups interested in public health training and practice.

15. A committee of the Council review and develop recommendations for consideration by the Council on questions of—

(*a*) Grants-in-aid to universities for the development and improvement of departments of public health and preventive medicine for undergraduate and graduate training.

(*b*) Postwar financing of nurse education.

16. The Public Health Service seek additional appropriations under authority of Public Law No. 410 (sec. 314a) for grants-in-aid to States for—

(*a*) Industrial hygiene programs.

(*b*) Consultant and technical services in the field of industrial hygiene.

17. The Public Health Service seek appropriations under authority of Public Law No. 410 (sec. 301a) for grants-in-aid for general research to be allotted to qualified institutions and individuals.

18. When the Federal Government undertakes grant-in-aid programs related to public health and sanitation, the Public Health Service be empowered to—

(*a*) Conduct the necessary investigations to determine the nature and extent of the health problem involved.

(*b*) Approve the allocation of funds, the functional effectiveness and placement of plants, installations, and constructions required in such programs.

The Council also approved the following Statement of Policy of the Public Health Service Relative to Federal Legislation on Water Pollution Control, after suggesting the italicized amendments:

"The general magnitude and importance of the water pollution problem in the United States, and its relation to the various uses of water and the public health have been well established. Likewise, the inability of State and local authorities adequately to control the pollution of interstate waters without the assistance of the central coordinating agency has been demonstrated over the years.

It is generally recognized that there is a need for Federal legislation to provide a stimulus to water pollution abatement activities and the necessary coordination of existing control authorities.

The Public Health Service has been engaged for many years in the investigation of interstate water pollution problems, individually and in cooperation with State and Federal agencies. This activity has been limited in scope since it has, of necessity, been confined to investigations.

The Public Health Service is interested in any Federal legislation dealing with the pollution control of interstate waters which provides for the following items:

1. Provisions for a Federal agency to act as a coordinator and adviser in matters pertaining to water pollution and its abatement, with authority to carry on investigations and other activities necessary in developing more efficient methods of treatment of sewage and wastes, *including the utilization of end and byproducts*, and in preparing comprehensive water pollution abatement programs.

2. The authorization for appropriations of funds sufficient in amount to permit the Federal agency properly to carry on the duties assigned to it.

3. Provision for an advisory board to the agency, the membership of which will include representatives of Federal agencies officially concerned with uses and control of water resources which may be affected by pollution.

4. Permission for States to form interstate compacts for cooperative effort in the prevention and abatement of pollution of interstate waters.

5. The authorization for appropriation of funds for allocation to States for promotion, investigations, and preparation of engineering reports and *programs* necessary for the prevention and abatement of water pollution.

6. The authorization for appropriation of funds for grants-in-aid or loans to civil subdivisions of government and loans to persons for the purpose of constructing sewage and waste treatment works.

7. Provision for the continuing interest by the Federal authority in the efficient operation of completed projects to insure that maximum benefits are derived from improvement works on which Federal funds have been expended.

The Public Health Service makes no recommendations at this time relative to the nature or degree of regulatory or enforcement provisions in water pollution control legislation. The decision as to the extent to which the Federal Government should be provided with, and exercise police powers in the control and abatement of water pollution is a matter primarily of legislative policy to be determined by the Congress."

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

June 17–July 14, 1945

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended July 14, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The poliomyelitis incidence rose from 302 cases during the 4 weeks ended June 16 to 678 during the 4 weeks ended July 14. The number of cases was only about 60 percent of the number reported during the corresponding period in 1944, but it was 1.6 times the 1940–44 median. The incidence was higher than in 1944 in only 3 of the 9 geographic sections of the country (New England, West South Central, and Pacific), but it was higher than the preceding 5-year median in all sections except the West North Central and Mountain. Of the total cases Texas reported 159, New York 82, California 61, Tennessee 53, New Jersey 40, Ohio and South Carolina 30 each, and Alabama 26 cases. The number of cases of this disease has been somewhat above the normal expectancy since the beginning of the year, but the rate of increase during the current period was considerably below that of the 2 preceding years and not much above the rate of increase that normally occurs at this season of the year.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period June 17–July 14, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	770	616	623	2,545	1,936	1,936	12,059	21,021	23,946
New England	25	13	13	75	16	5	1,440	2,347	4,320
Middle Atlantic	70	64	93	18	10	22	2,303	3,935	6,666
East North Central	108	77	100	62	61	102	2,475	3,863	5,810
West North Central	72	62	45	37	8	26	479	923	1,263
South Atlantic	109	93	88	573	581	581	283	1,942	1,719
East South Central	58	45	50	58	97	73	172	238	503
West South Central	161	120	111	1,468	943	943	993	2,007	1,035
Mountain	46	42	42	194	166	199	723	603	1,071
Pacific	121	100	77	60	54	144	3,191	5,163	2,386
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	502	792	288	678	1,099	415	6,494	5,673	5,053
New England	25	42	41	25	14	8	622	643	519
Middle Atlantic	98	190	74	128	232	24	1,755	1,237	1,237
East North Central	114	145	15	50	104	35	1,710	1,412	1,412
West North Central	34	69	16	21	29	29	514	412	345
South Atlantic	60	121	51	105	401	24	476	457	275
East South Central	51	60	21	87	184	60	169	120	162
West South Central	52	50	21	187	73	56	232	152	129
Mountain	10	20	7	6	12	12	183	283	132
Pacific	58	95	46	69	50	50	833	957	356
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	18	19	51	498	501	790	10,251	8,461	13,933
New England	0	0	0	12	20	22	937	566	794
Middle Atlantic	0	0	0	40	34	74	2,614	1,011	2,640
East North Central	6	10	15	53	49	78	1,398	1,575	3,182
West North Central	6	3	11	12	24	36	285	648	725
South Atlantic	0	1	1	140	118	163	1,987	1,978	1,978
East South Central	1	0	6	74	69	99	398	690	581
West South Central	4	2	4	127	138	204	1,079	1,096	1,453
Mountain	1	1	5	28	21	26	398	490	769
Pacific	0	2	4	12	28	28	1,155	407	1,314

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

Meningococcus meningitis.—The number of cases of meningococcus meningitis dropped from 634 during the preceding 4 weeks to 502 during the current 4 weeks. The number represented a 35-percent decline from the figure for the corresponding period in 1944, but it was 1.7 times the preceding 5-year (1940–44) median. In the West South Central section the incidence stood at last year's level, but in all other sections the number of cases declined. Compared with the 5-year median the incidence was relatively high in all sections of the country except New England.

Diphtheria.—For the 4 weeks ended July 14 there were 770 cases of diphtheria reported, the number being about 25 percent above the preceding 5-year median for the corresponding period. While every section of the country except the Middle Atlantic reported an increase over the median, the greatest excesses occurred in the New England,

West North Central, West South Central, and Pacific sections. For the country as a whole the current incidence is the highest for this period since 1939. This disease has maintained a comparatively high level since the latter part of 1944. Since the beginning of the current year there have been approximately 7,100 cases reported as compared with about 5,800 for the same 24 weeks in 1944.

Influenza.—The influenza incidence (2,545 cases) was about 30 percent above the median expectancy. The New England and West South Central sections appeared to be mostly responsible for the increase. In the former region, the number of cases was not large, but it was 15 times the median number, while in the latter region the number of cases (1,468) was about 50 percent above the median. In all other sections the incidence either closely approximated that of last year or fell below it.

Scarlet fever.—There were 6,494 cases of scarlet fever reported for the 4 weeks ended July 14, the number being about 15 percent above the 1944 figure for these weeks and 30 percent above the 1940–44 median. In the East South Central section the incidence was about normal, but all other sections reported excesses ranging from 1.2 times the median in the New England and East North Central sections to 2.3 times the median in the Pacific section.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—For the 4 weeks ended July 14 there were 12,059 cases of measles reported as compared with 21,021 for the corresponding weeks in 1944 and a 5-year (1940–44) median of approximately 24,000 cases. For the country as a whole the current incidence was the lowest in the 17 years for which these data are available. In the Pacific section the number of cases (3,191) was about 35 percent above the normal seasonal expectancy, but in all other sections the incidence was relatively low.

Smallpox.—The number of cases (18) of smallpox reported for the current period was about on a level with the incidence for the corresponding period in 1944. The 1940–44 median for this period was 51 cases. Twelve of the total cases occurred in the North Central section, 4 in the West South Central section, and 1 each in the East South Central and Mountain sections. The current figures for this disease compare with such figures as 648 in 1938, 1,675 in 1931, and 3,111 in 1930.

Typhoid and paratyphoid fever.—The incidence of this disease was also about the same as during the corresponding weeks in 1944. The number of cases (498) was about 65 percent of the 1940–44 median (790 cases). The number of cases reported in the Mountain section was about normal for this season of the year, but in all other sections

of the country the incidence was considerably below that of recent years.

Whooping cough.—The number of cases (10,251) of whooping cough was about 20 percent above the 1944 figure for this period and 25 percent below the 1940–44 median. The incidence was above normal in the New England section, about normal in the Middle Atlantic and South Atlantic sections, and below the median expectancy in the remaining 6 sections.

MORTALITY, ALL CAUSES

For the 4 weeks ended July 14 there were 34,665 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding period in the years 1942–44 was 33,253 deaths. The number of deaths for each of the first 3 weeks of the current 4-week period was higher than the preceding 3-year average, but during the last week of the period the number was about 0.2 percent less than the average. The increase for the 4 weeks as a whole was 4.2 percent.

DEATHS DURING WEEK ENDED JULY 14, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 14, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8, 174	8, 845
Average for 3 prior years	8, 340	
Total deaths, first 28 weeks of year	260, 122	264, 129
Deaths under 1 year of age	612	615
Average for 3 prior years	594	
Deaths under 1 year of age, first 28 weeks of year	17, 088	17, 382
Data from industrial insurance companies:		
Policies in force	67, 323, 083	66, 661, 607
Number of death claims	12, 746	11, 148
Death claims per 1,000 policies in force, annual rate	9. 9	8. 7
Death claims per 1,000 policies, first 28 weeks of year, annual rate	10. 7	10. 4

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 21, 1945

Summary

For the country as a whole, an increase of 115 cases, or 45 percent, was recorded for the week in the incidence of poliomyelitis. A total of 369 cases was reported, as compared with 254 last week, 568 for the corresponding week last year, and a 5-year (1940–44) median of 249.

About 90 percent of the total net increase occurred in 9 of the 10 States which reported 10 or more cases each and these States reported an aggregate of 247 cases, as compared with 143 in the same States last week. These States are as follows (last week's figures in parentheses): Massachusetts 14 (2), New York 46 (29), New Jersey 37 (23), Pennsylvania 12 (4), Virginia 28 (7), South Carolina 12 (11), Texas 62 (45), Utah 11 (0), California 25 (22). A decline occurred in Tennessee, 20 cases being reported currently, as compared with 27 last week.

The total for the year to date is 2,048, as compared with 2,320 for the same period last year and a 5-year median of 1,223. The total for the past 5 weeks is 1,049, as compared with 1,663 for the same period last year.

Of the total of 114 cases of meningococcus meningitis reported for the week, as compared with 128 last week and a 5-year median of 45, 26 occurred in New York and California (13 each), the only States which reported more than 9 cases each. The total to date is 5,770, as compared with 12,418 for the same period last year and a 5-year median of 2,188.

No unusual incidence was reported for any of the other communicable diseases, although the totals to date are slightly higher than for last year for diphtheria, the dysenteries, tularemia, undulant fever, murine typhus, and whooping cough. To date both smallpox and typhoid fever have established new lows.

A total of 7,654 deaths was recorded for the week in 91 large cities of the United States, as compared with 8,123 last week, a 3-year (1942–44) average of 8,152, and 7,722 for the corresponding week last year. The cumulative total is 265,885, as compared with 269,761 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended July 21, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended— July 21, 1945	Diphtheria: Week ended— July 22, 1944	Diphtheria: Median 1940–44	Influenza: Week ended— July 21, 1945	Influenza: Week ended— July 22, 1944	Influenza: Median 1940–44	Measles: Week ended— July 21, 1945	Measles: Week ended— July 22, 1944	Measles: Median 1940–44	Meningitis, meningococcus: Week ended— July 21, 1945	Meningitis, meningococcus: Week ended— July 22, 1944	Meningitis, meningococcus: Median 1940–44
NEW ENGLAND												
Maine	0	1	0	------	------	------	1	10	43	0	1	1
New Hampshire	0	0	0	------	------	------	1	5	5	0	0	0
Vermont	0	0	0	------	------	------	5	7	25	0	0	0
Massachusetts	0	5	2	------	------	------	142	177	222	2	10	2
Rhode Island	0	0	0	------	13	------	3	8	38	2	2	1
Connecticut	0	0	0	------	------	------	22	37	69	2	5	0
MIDDLE ATLANTIC												
New York	7	6	6	[1] 2	([1])	[1] 1	70	152	486	13	34	9
New Jersey	3	1	2	1	4	2	34	121	251	3	10	1
Pennsylvania	3	5	5	------	1	------	111	131	131	4	10	3
EAST NORTH CENTRAL												
Ohio	5	0	3	3	1	5	12	18	73	2	7	1
Indiana	4	7	4	2	3	3	3	4	14	3	4	2
Illinois	3	3	10	4	1	4	178	32	106	5	5	1
Michigan [2]	15	4	3	1	------	1	100	84	241	4	7	2
Wisconsin	4	1	1	19	9	9	45	168	373	4	1	0
WEST NORTH CENTRAL												
Minnesota	6	3	1	------	------	1	2	33	33	3	3	0
Iowa	1	3	1	------	------	------	12	30	31	0	4	1
Missouri	4	5	4	1	------	------	17	5	11	9	3	0
North Dakota	1	0	0	11	------	------	3	1	8	0	3	0
South Dakota	1	0	1	------	------	------	8	0	3	1	0	0
Nebraska	3	0	0	1	3	3	3	11	7	0	0	0
Kansas	3	1	1	1	4	1	9	22	41	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	3	1	1	0	0	0
Maryland [2]	0	0	0	4	------	1	8	11	15	4	5	5
District of Columbia	0	0	0	------	------	------	0	9	9	0	1	0
Virginia	4	2	7	68	38	36	4	30	45	1	7	7
West Virginia	3	3	3	19	------	1	2	14	14	0	2	0
North Carolina	6	6	4	------	------	------	5	50	50	4	8	0
South Carolina	9	5	3	58	87	87	4	38	16	1	6	1
Georgia	6	7	3	6	7	9	3	12	10	1	0	1
Florida	5	16	3	------	2	4	0	45	10	2	6	0
EAST SOUTH CENTRAL												
Kentucky	2	3	3	------	1	------	7	13	19	5	2	2
Tennessee	4	3	3	5	10	8	6	6	25	8	3	0
Alabama	3	3	3	14	12	12	4	12	27	4	4	4
Mississippi [2]	5	3	2	------	------	------	------	------	------	1	0	0
WEST SOUTH CENTRAL												
Arkansas	3	3	3	4	13	5	8	21	21	2	1	1
Louisiana	[3] 10	5	5	2	8	4	[3] 5	7	5	[3] 3	2	1
Oklahoma	1	0	2	19	------	2	3	9	9	1	3	1
Texas	35	23	23	330	160	160	81	125	103	1	8	3
MOUNTAIN												
Montana	1	0	0	------	------	1	7	3	7	1	1	0
Idaho	1	0	0	10	------	------	12	2	3	0	0	0
Wyoming	2	0	0	------	------	------	8	9	8	0	0	0
Colorado	2	6	6	3	------	3	9	8	24	0	0	0
New Mexico	3	0	0	3	------	1	3	18	17	0	0	0
Arizona	1	0	0	19	16	25	1	13	13	0	0	1
Utah [2]	0	0	0	------	6	------	100	19	33	0	2	0
Nevada	0	1	0	------	------	------	1	21	5	1	0	0
PACIFIC												
Washington	1	2	1	1	------	------	93	61	36	2	3	1
Oregon	7	1	1	2	7	5	26	39	38	1	2	1
California	21	17	13	2	3	11	352	442	288	13	11	2
Total	198	154	148	615	409	409	1,536	2,094	3,313	114	186	45
29 weeks	[3] 7,318	6,021	6,765	68,307	336,856	167,533	[3] 97,111	586,074	528,294	[3] 5,770	12,418	2,188

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Corrections: Louisiana, week ended June 30, diphtheria 5 (instead of 4); measles 46 (instead of 27), meningococcus meningitis 2 (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended July 21, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	July 21, 1945	July 22, 1944		July 21, 1945	July 22, 1944		July 21, 1945	July 22, 1944		July 21, 1945	July 22, 1944	
NEW ENGLAND												
Maine	3	0	0	2	7	6	0	0	0	2	0	0
New Hampshire	4	3	0	0	0	2	0	0	0	0	1	0
Vermont	2	0	0	7	2	2	0	0	0	0	0	0
Massachusetts	14	6	1	62	35	37	0	0	0	2	3	1
Rhode Island	0	0	0	1	0	2	0	0	0	0	0	0
Connecticut	3	0	0	15	12	12	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	46	153	6	98	67	79	0	0	0	5	4	9
New Jersey	37	7	4	28	15	19	0	0	0	2	1	3
Pennsylvania	12	56	3	67	62	43	0	0	0	10	3	6
EAST NORTH CENTRAL												
Ohio	8	14	1	54	51	51	0	0	0	1	2	8
Indiana	2	10	2	14	10	10	0	0	0	2	4	3
Illinois	6	13	7	69	35	43	0	0	1	2	4	5
Michigan [2]	3	24	7	64	48	48	0	1	1	7	1	3
Wisconsin	0	2	1	40	37	37	0	0	1	0	1	0
WEST NORTH CENTRAL												
Minnesota	0	3	0	23	29	27	0	0	0	0	0	0
Iowa	1	8	4	14	8	8	0	0	0	0	1	1
Missouri	4	3	2	17	9	12	0	0	0	8	8	5
North Dakota	0	3	1	3	5	2	0	0	0	0	0	0
South Dakota	6	0	0	3	0	5	0	0	0	0	0	0
Nebraska	1	3	1	11	2	3	0	0	0	0	0	0
Kansas	8	5	5	37	9	10	1	0	0	0	0	1
SOUTH ATLANTIC												
Delaware	2	0	0	1	0	0	0	0	0	0	0	0
Maryland [2]	6	10	1	19	21	14	0	0	0	0	4	3
District of Columbia	9	8	0	4	3	3	0	0	0	0	0	0
Virginia	28	30	2	16	18	4	0	0	0	5	4	4
West Virginia	1	4	2	19	25	18	0	0	0	1	5	8
North Carolina	3	62	3	14	18	10	0	2	0	2	12	12
South Carolina	12	4	3	2	5	2	0	0	0	2	11	11
Georgia	5	5	4	7	11	11	0	0	0	11	14	23
Florida	2	5	1	2	4	1	0	0	0	1	6	3
EAST SOUTH CENTRAL												
Kentucky	3	77	4	21	8	15	0	1	0	8	11	11
Tennessee	20	1	1	12	17	14	0	0	0	6	9	11
Alabama	3	7	5	5	8	8	0	0	0	3	8	8
Mississippi [2]	0	5	5	5	3	3	0	0	0	4	4	6
WEST SOUTH CENTRAL												
Arkansas	3	0	1	4	5	4	0	0	0	2	9	14
Louisiana	[5] 4	5	5	3	4	3	0	0	0	12	15	14
Oklahoma	9	4	2	9	0	6	0	0	0	4	4	8
Texas	62	9	8	34	31	17	0	1	0	20	21	28
MOUNTAIN												
Montana	0	1	1	2	4	4	0	0	0	0	1	1
Idaho	0	0	0	8	6	2	0	0	0	0	0	0
Wyoming	0	0	0	1	2	2	0	0	0	0	0	0
Colorado	2	0	0	11	9	9	0	0	0	1	1	2
New Mexico	0	0	1	13	7	1	0	0	0	2	0	3
Arizona	0	0	0	2	11	4	0	0	1	0	0	1
Utah [2]	11	0	0	11	12	6	0	0	0	1	0	1
Nevada	0	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	4	1	1	12	45	14	0	0	0	0	2	1
Oregon	1	6	3	9	4	4	0	0	0	0	2	2
California	25	11	11	121	87	42	0	0	0	2	6	6
Total	369	568	249	996	812	807	1	5	12	129	183	269
29 weeks	[5] 2,048	2,320	1,223	131,152	144,569	94,785	255	283	596	2,133	2,584	3,116

[2] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately as follows: Massachusetts 2; New York 3; Georgia 4; Louisiana 3; Texas 8; New Mexico 1; Utah 1; California 1.
[5] Correction: Louisiana, week ended June 30, poliomyelitis 2 (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended July 21, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Whooping cough: Week ended— July 21, 1945	Whooping cough: Week ended— July 22, 1944	Whooping cough: Median 1940–44	Week ended July 21, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	67	2	28	0	0	0	0	0	0	0	2
New Hampshire	9	0	0	0	0	0	0	0	0	0	0
Vermont	15	19	10	0	0	0	0	0	0	0	0
Massachusetts	141	81	141	0	17	0	0	0	0	0	0
Rhode Island	4	4	22	0	1	0	0	0	0	0	0
Connecticut	25	68	45	0	0	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	302	110	269	0	2	0	0	1	0	0	10
New Jersey	253	76	118	4	0	0	0	2	0	0	2
Pennsylvania	196	63	274	0	0	0	1	1	0	0	5
EAST NORTH CENTRAL											
Ohio	186	182	193	0	0	0	2	1	0	0	0
Indiana	29	25	30	1	0	0	0	0	0	0	2
Illinois	91	63	158	2	1	0	0	3	0	0	5
Michigan [2]	165	134	235	3	1	0	0	0	0	0	20
Wisconsin	50	136	161	0	0	0	0	0	1	0	5
WEST NORTH CENTRAL											
Minnesota	11	43	43	1	0	0	0	0	0	0	2
Iowa	8	14	30	0	0	0	0	0	0	0	16
Missouri	40	44	44	0	0	3	0	1	1	0	2
North Dakota	2	6	10	0	0	0	0	0	0	0	0
South Dakota	0	12	10	0	0	0	0	0	0	0	1
Nebraska	2	10	9	0	0	0	0	0	0	0	0
Kansas	39	59	58	0	7	0	0	0	0	0	6
SOUTH ATLANTIC											
Delaware	0	1	2	0	0	0	0	0	0	0	0
Maryland [2]	83	128	112	0	0	1	0	3	0	0	1
District of Columbia	10	2	9	0	0	0	0	0	0	0	0
Virginia	89	52	52	0	0	235	0	6	2	1	0
West Virginia	79	32	32	0	0	0	0	0	0	0	1
North Carolina	206	199	199	2	2	0	0	2	0	4	0
South Carolina	82	106	106	2	58	0	0	0	0	2	0
Georgia	14	22	28	0	18	0	0	3	1	38	3
Florida	20	34	12	7	0	0	0	0	0	16	0
EAST SOUTH CENTRAL											
Kentucky	61	82	82	0	1	0	0	1	0	0	0
Tennessee	15	33	39	1	0	13	0	0	4	0	3
Alabama	29	31	27	0	0	0	0	0	0	22	1
Mississippi [2]	0	------	--------	0	0	0	0	0	0	4	7
WEST SOUTH CENTRAL											
Arkansas	15	22	25	16	12	0	[6] 0	0	1	0	1
Louisiana	6	0	7	[6] 2	[6] 1	0	0	0	0	11	2
Oklahoma	11	5	18	0	0	0	0	2	0	0	0
Texas	147	231	231	58	485	57	0	0	1	65	12
MOUNTAIN											
Montana	7	9	27	0	0	0	0	0	1	0	0
Idaho	14	0	5	0	1	0	0	1	0	0	1
Wyoming	2	1	6	0	0	0	0	0	2	0	0
Colorado	45	21	15	0	0	0	0	0	0	0	0
New Mexico	7	3	13	0	3	1	0	0	0	0	0
Arizona	15	19	19	0	0	23	0	0	0	0	0
Utah [2]	37	76	76	0	0	0	0	0	1	0	4
Nevada	0	1	1	0	0	0	0	0	0	0	0
PACIFIC											
Washington	36	32	49	0	0	0	0	0	0	0	1
Oregon	[6] 19	10	19	0	1	0	0	0	0	0	0
California	240	81	242	12	4	0	8	0	1	1	6
Total	2,924	2,384	3,439	111	615	333	11	27	16	164	123
Same week 1944	2,384	------	--------	55	702	348	15	25	14	185	75
Average, 1942–44	3,338	------	--------	64	554	364	13	[7] 25	17	[7] 131	------
29 weeks: 1945	[6] 73,290	------	--------	[6] 1,045	[6] 13,607	3,876	[6] 205	231	456	1,986	2,729
1944	54,203	------	--------	906	11,335	3,951	323	262	344	1,828	2,001
Average, 1942–44	93,835	------	[7] 109,174	880	7,948	3,325	306	[7] 262	484	[7] 1,271	------

[2] Period ended earlier than Saturday.

[6] Corrections: Arkansas, week ended June 30, encephalitis 1 (instead of 0). Louisiana, week ended June 30, amebic dysentery 9 (instead of 1), bacillary dysentery 8 (instead of 1). Oregon, week ended July 7, whooping cough 15 (instead of 0).

[7] 5-year median, 1940–44.

Leprosy: Minnesota 1, California 1.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 14, 1945

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	0	0	0	0	3
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	0	0	0	
Vermont:												
Barre	0	0	------	0	12	0	0	0	0	0	0	
Massachusetts:												
Boston	0	0	------	0	45	0	16	0	15	0	0	21
Fall River	0	0	------	0	1	0	0	0	2	0	0	0
Springfield	0	0	------	0	1	0	0	0	2	0	0	1
Worcester	0	0	------	0	50	0	4	0	0	0	0	3
Rhode Island:												
Providence	0	1	------	0	0	0	1	0	1	0	0	18
Connecticut:												
Bridgeport	0	0	------	0	0	1	0	1	1	0	0	0
Hartford	1	0	------	0	18	1	1	0	2	0	0	1
New Haven	0	0	1	0	0	0	0	0	0	0	0	2
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	3	0	5	3	1	0	0	1
New York	6	1	1	------	59	10	------	9	40	0	5	152
Rochester	0	0	------	0	4	1	1	2	3	0	0	16
Syracuse	0	0	------	0	0	0	0	0	0	0	0	34
New Jersey:												
Camden	3	0	------	0	4	0	0	0	1	0	0	5
Newark	0	0	------	0	1	0	3	3	4	0	0	23
Trenton	0	0	2	0	2	0	0	3	0	0	1	8
Pennsylvania:												
Philadelphia	3	0	------	0	118	1	20	1	16	0	0	90
Pittsburgh	0	0	------	0	0	1	5	1	12	0	0	17
Reading	0	0	------	0	0	0	0	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	1	4	1	8	1	2	0	0	10
Cleveland	0	0	------	0	2	0	4	1	4	0	1	50
Columbus	1	2	------	0	1	0	2	0	2	0	0	7
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	0	0	0	1
Indianapolis	4	0	------	1	2	0	8	0	7	0	0	18
South Bend	0	0	------	0	1	0	0	0	3	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	1	0	------	0	170	1	15	3	25	0	1	81
Springfield	0	0	------	0	0	0	1	0	3	0	0	0
Michigan:												
Detroit	5	0	------	0	99	2	5	0	22	0	0	46
Flint	0	0	------	0	0	0	3	0	0	0	0	0
Grand Rapids	0	0	------	0	1	0	1	0	1	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	4	0	0	0	0	0	0	4
Milwaukee	0	0	------	0	16	1	1	0	15	0	0	4
Racine	0	0	------	0	0	1	1	0	1	0	0	5
Superior	0	0	------	0	2	0	0	0	1	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	2	0	0	0	8	0	0	0
Minneapolis	0	0	------	0	0	2	3	0	6	0	0	2
St. Paul	0	0	------	0	2	1	2	0	1	0	0	5
Missouri:												
Kansas City	0	0	------	0	5	1	5	0	5	0	0	9
St. Joseph	0	0	------	0	3	0	0	1	1	0	0	0
St. Louis	4	0	1	2	11	0	4	1	3	0	0	23

City reports for week ended July 14, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	0	0	0	0	0	0	0	0
Nebraska:												
Omaha	2	0	------	0	0	0	2	0	2	0	0	0
Kansas:												
Topeka	0	0	------	0	0	1	0	0	5	0	0	0
Wichita	0	0	------	0	1	0	1	0	2	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	0	0	0	0	0	0
Maryland:												
Baltimore	4	0	------	0	2	0	6	0	9	0	0	57
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	1	0	1	1	3	6	7	0	0	12
Virginia:												
Lynchburg	0	0	------	0	1	0	0	0	1	0	0	0
Richmond	0	0	------	0	0	1	0	2	2	0	0	5
Roanoke	0	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	0	0	1	0
Wheeling	0	0	------	0	0	1	0	0	0	0	1	0
North Carolina:												
Raleigh	0	0	------	0	2	0	1	1	0	0	0	6
Wilmington	0	0	------	0	0	0	0	0	0	0	0	8
Winston-Salem	0	0	------	0	0	0	0	0	0	0	0	33
South Carolina:												
Charleston	0	0	------	0	1	0	1	0	0	0	1	6
Georgia:												
Atlanta	0	0	------	0	0	0	2	1	3	0	0	3
Brunswick	0	0	------	0	0	0	1	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	2	0	3	0	0	0	0	17
Nashville	0	0	------	0	1	1	1	1	2	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	1	5	4	4	0	0	0
Mobile	0	0	------	1	0	0	1	0	3	0	0	1
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	0	0	0	0
Louisiana:												
New Orleans	8	0	------	0	9	1	1	1	3	0	0	0
Shreveport	0	0	------	0	0	0	3	1	1	0	0	0
Texas:												
Dallas	0	0	------	0	1	0	0	5	2	0	0	4
Galveston	0	0	------	0	0	0	3	1	0	0	0	0
Houston	2	0	------	0	0	0	6	5	0	0	0	0
San Antonio	2	0	------	0	0	0	4	2	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	0	0	1	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	1	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	4	0	1	0	2	0	4	0	1	0	0	13
Pueblo	0	0	------	0	0	0	1	0	0	0	0	0
Utah:												
Salt Lake City	0	0	------	0	21	0	3	0	1	0	0	11

City reports for week ended July 14, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	0	0	------	0	30	0	6	2	6	0	0	3
Spokane	0	0	------	0	4	0	2	0	0	0	0	0
Tacoma	0	0	------	0	25	0	1	0	0	0	0	2
California:												
Los Angeles	7	0	1	1	27	3	1	2	16	0	0	31
Sacramento	0	0	------	0	1	0	3	0	5	0	0	2
San Francisco	1	0	2	0	53	0	4	2	14	0	0	8
Total	60	4	10	6	828	35	191	66	301	0	12	891
Corresponding week, 1944	40	------	17	8	754	------	259	------	268	0	26	677
Average, 1940-44	43	------	24	[1] 7	[2] 1,441	------	[1] 244	------	330	0	26	1,078

[1] 3-year average, 1942-44.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York, 1; Philadelphia, 1.
Dysentery, bacillary.—Cases: New York, 5; Cleveland, 1; Charleston, S. C., 11; Los Angeles, 1.
Dysentery, unspecified.—Cases: Baltimore, 1.
Rocky Mountain spotted fever.—Cases: Lynchburg, 1; Richmond, 1; Denver, 1.
Typhus fever, endemic.—Cases: New York, 1; Atlanta, 1; Birmingham, 1; Mobile, 2; New Orleans, 1; Houston, 2; San Antonio, 2.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,130,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	2.6	2.6	2.6	0.0	332	5.2	60.1	2.6	60	0.0	0.0	128
Middle Atlantic	5.6	0.5	1.4	0.0	88	6.0	15.7	10.2	36	0.0	2.8	160
East North Central	7.3	1.2	0.0	1.2	184	3.6	30.4	3.0	52	0.0	1.2	139
West North Central	13.9	0.0	1.9	4.0	48	9.9	33.8	4.0	66	0.0	0.0	88
South Atlantic	7.1	0.0	1.8	0.0	12	5.3	24.7	17.7	41	0.0	5.3	230
East South Central	0.0	0.0	0.0	5.9	18	11.8	59.0	29.5	53	0.0	0.0	106
West South Central	34.4	0.0	0.0	0.0	29	2.9	51.7	43.0	17	0.0	0.0	14
Mountain	33.0	0.0	8.3	0.0	198	0.0	66.1	0.0	17	0.0	8.3	198
Pacific	12.7	0.0	4.7	1.6	221	4.7	26.9	9.5	65	0.0	0.0	73
Total	9.2	0.6	1.5	0.9	127	5.4	29.2	10.1	46	0.0	1.8	136

PLAGUE INFECTION IN CHEYENNE COUNTY, KANS.

Plague infection has been reported proved, on July 17, in a pool of 17 fleas from 21 mice, *Microtus*, sp., taken on July 7 at a location in Cheyenne County, Kans., 5 miles east on an unmarked road from a point on State Highway No. 61, 5 miles south of Benkleman, Nebr., and in another pool of 73 fleas from 116 mice, *Peromyscus*, sp., taken at the same time and place. This is the same location from which specimens collected on June 2 were taken and proved plague-infected on June 23. (See Public Health Reports July 20, p. 849.)

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended June 30, 1945.—During the week ended June 30, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox	21	31	1	57	261	92	10	107	78	658
Diphtheria	1	3	----	21	----	1	----	----	2	28
Dysentery, bacillary	----	----	----	8	----	----	----	----	----	8
Encephalitis, infectious	----	----	----	----	----	1	----	----	----	1
German measles	----	2	----	5	35	----	2	35	36	115
Influenza	42	4	----	----	13	----	----	----	3	62
Measles	2	1	----	28	229	14	43	54	132	503
Meningitis, meningococcus	----	----	3	2	1	----	----	----	1	7
Mumps	----	8	----	30	111	43	22	54	11	279
Poliomyelitis	----	----	----	----	2	----	----	----	2	4
Scarlet fever	2	1	5	78	82	12	13	12	7	212
Tuberculosis (all forms)	----	6	7	103	31	14	----	2	8	171
Typhoid and paratyphoid fever	----	----	----	3	----	----	----	1	----	4
Undulant fever	----	----	----	1	1	----	----	----	----	2
Venereal diseases:										
Gonorrhea	1	25	39	104	179	38	31	25	84	526
Syphilis	1	21	9	82	71	9	6	8	29	236
Whooping cough	2	1	1	75	26	2	----	11	3	121

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

(Few reports are available from the invaded countries of Europe and other nations in war zones.)

Cholera

China—Szechwan Province.—According to an unofficial report dated July 16, 1945, cholera was said to be spreading to Kweyang where 26 cases were reported, 8 of which were fatal. About 50 deaths daily from cholera were also reported in Chengtu, Szechwan Province, China.

Plague

Canada—Alberta Province.—On July 4, 1945, plague infection was reported in 1 squirrel found north and east of Cereal, Acadia, Alberta Province, Canada.

Egypt.—For the week ended June 16, 1945, 12 cases of plague were reported in Egypt.

France—Corsica—Ajaccio.—For the week ended July 14, 1945, 2 cases of plague with 1 death were reported in Ajaccio, Corsica, France.

Great Britain—Malta.—Information dated July 9, 1945, states that 8 cases of plague of which 4 cases have been confirmed have been reported in Mdida Gzira Hamrun, Malta, Great Britain.

Morocco (French).—For the period June 21–30, 1945, 77 cases of plague were reported in French Morocco.

Peru.—For the month of May 1945, plague was reported in Peru by Departments as follows: Ica Department, Chincha, 1 case; Libertad Department, Province of Otuzco—La Quesera, 2 cases, Farm Huayabamba, 1 case.

Smallpox

Belgian Congo.—For the week ended June 23, 1945, 599 cases of smallpox with 4 deaths were reported in Belgian Congo.

Bolivia—Beni Department—Magdalena.—Information dated July 14, 1945, states that 200 cases of smallpox have occurred in Magdalena, Beni Department, Bolivia.

Morocco (French).—For the period June 21–30, 1945, 75 cases of smallpox were reported in French Morocco.

Union of South Africa.—For the month of April 1945, 241 cases of smallpox with 20 deaths were reported in the Union of South Africa.

Uruguay—Rocha Department.—For the week ended June 30, 1945, 19 cases of smallpox (alastrim) were reported in the Department of Rocha, Uruguay. Vaccination is being carried on in the whole country.

Typhus Fever

Cameroon (French).—For the period June 21–30, 1945, 5 cases of typhus fever were reported in the Nyongetsanaga region, French Cameroon.

Egypt.—For the week ended June 16, 1945, 406 cases of typhus fever with 55 deaths were reported in Egypt.

France.—For the period June 2–27, 1945, 127 imported cases of typhus fever were reported in France.

Iran.—For the week ended March 17, 1945, 29 cases of typhus fever were reported in Iran.

Morocco (French).—For the period June 21–30, 1945, 415 cases of typhus fever were reported in French Morocco, including 23 cases reported in Casablanca and 6 cases in Rabat.

Turkey.—For the week ended July 14, 1945, 42 cases of typhus fever were reported in Turkey, including 6 cases reported in Istanbul, 1 case in Izmir, and 2 cases in Zonguldak.

Union of South Africa.—For the month of April 1945, 131 cases of typhus fever with 9 deaths were reported in the Union of South Africa.

Yellow Fever

Gold Coast—Nsawam.—On June 29, 1945, 1 case of suspected yellow fever was reported in Nsawam. On July 14, 1945, 1 case of suspected yellow fever was reported in Nsawam with the place of onset as Mangoase, Gold Coast.

Ivory Coast—Grand Bassam.—On July 14, 1945, 1 case of suspected yellow fever was reported in Grand Bassam, Ivory Coast.

Peru—Loreto Department—San Martin Province.—For the month of April 1945, 1 confirmed case of yellow fever was reported in San Martin Province, Loreto Department, Peru.

Venezuela.—According to telegraphic information dated July 10 and July 13, 1945, 1 case of yellow fever was reported in the village of Las Mesas and 2 cases of yellow fever were reported in the village of Omuquena, La Grita municipality, Jauregui District, Tachira State, Venezuela. Two cases of yellow fever were also reported in the village of Cuchilla Los Cristales, and 1 case in the village of Mesa del Carmen, Seboruco municipality, Jauregui District, Tachira State. Telegraphic information dated July 20, 1945, states that 1 case of yellow fever was reported in the village of Los Giros, Zea municipality, Merida State, Venezuela, and 1 case of yellow fever was reported in the village of Suruma, Perija municipality, Zulia State, Venezuela. All cases have been confirmed.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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CROSS IMMUNITY BETWEEN FOUR STRAINS OF TSUTSUGAMUSHI DISEASE (SCRUB TYPHUS)[1]

By NORMAN H. TOPPING, *Surgeon, United States Public Health Service*

Cross immunity tests have been done in guinea pigs with four separate strains of tsutsugamushi disease virus. Two of the strains, Karp and case No. 9, were from the New Guinea area, the Seerangayee strain was from Malaya, and the Gilliam from the Assam-Burma border. These four strains were selected for their wide geographic distribution. All four strains were well adapted to guinea pigs and were being passed by intraperitoneal inoculations of a liver and spleen suspension (approximately 10 percent). The Seerangayee strain has a high fatality rate and, in order to have a sufficient number of recovered animals from this strain, it was necessary to inoculate guinea pigs subcutaneously. The cross-immunity tests were done by inoculating recovered guinea pigs intraperitoneally with one of the heterologous strains.

The following charts show graphically the results of these tests:

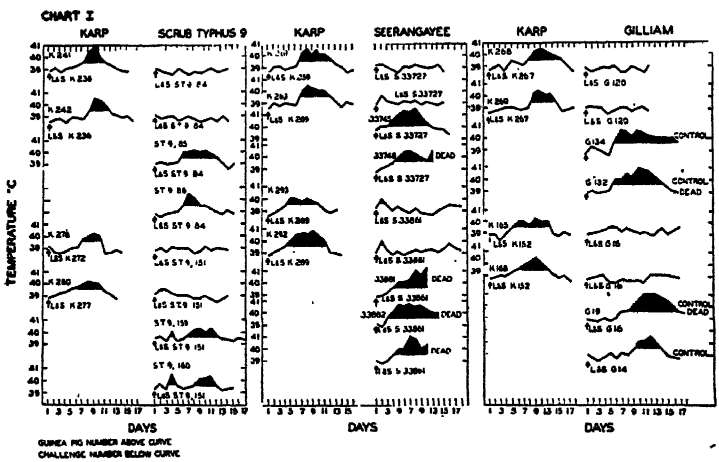

FIGURE 1.—Karp, challenged with Gilliam, Seerangayee, and case No. 9.

[1] From the Division of Infectious Diseases, National Institute of Health. This paper was approved for publication February 9, 1945, and scheduled for publication in PUBLIC HEALTH REPORTS in the issue of March 16, 1945. Because of the subject matter the paper was withheld from publication at that time.

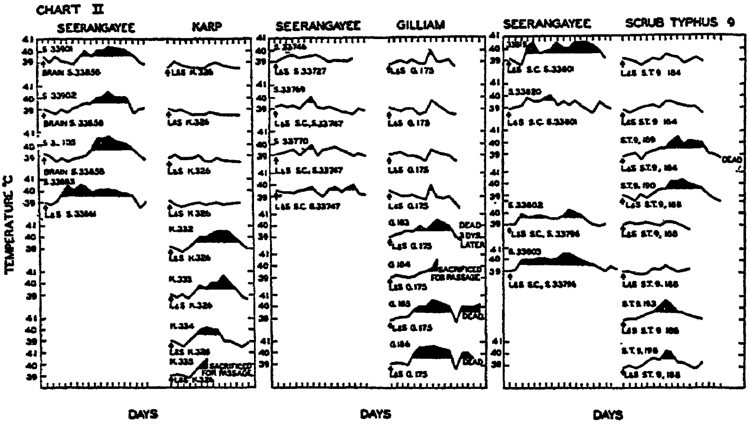

FIGURE 2.—Seerangayee, challenged with Gilliam, Karp, and case No. 9.

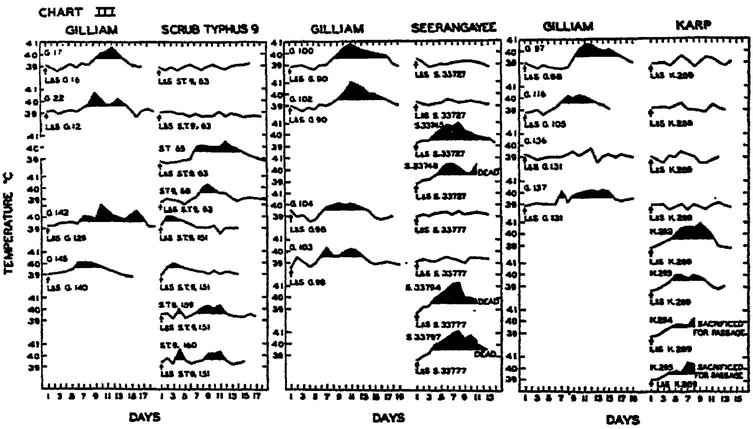

FIGURE 3.—Gilliam, challenged with Seerangayee, Karp, and case No. 9.

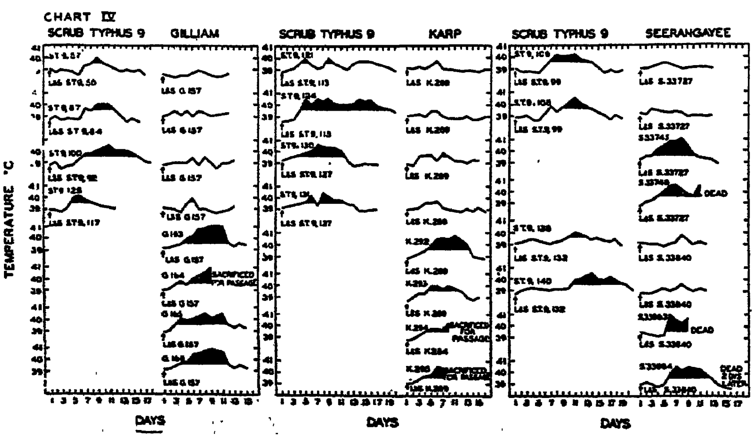

FIGURE 4.—Case No. 9, challenged with Seerangayee, Karp, and Gilliam.

It is clear from the results of these tests that cross-immunity exists in guinea pigs between these four strains of tsutsugamushi disease. The only differences observed in the strains were fatality rates in guinea pigs, the Seerangayee having the highest rate and case No. 9 the lowest, with the Karp and the Gilliam intermediate. The results do not necessarily mean that these four strains are immunologically identical. As an example, cross immunity exists between epidemic and murine typhus yet by other immunological procedures they have been shown to be distinct.

A NEW REACTION TIME APPARATUS AND A NEW METHOD OF ADMINISTERING THE REACTION TIME TEST [1]

By R. B. Malmo, *Passed Assistant Sanitarian (R)*, and L. R. Crisp, *Associate Mechanical Engineer, United States Public Health Service*

One of the chief functions of the psychophysiologist working in industrial hygiene is to provide techniques for measuring the decrement of performance when the organism is operating under extreme environmental conditions. In safeguarding the health of workers, the psychophysiologist is responsible for accurate statements concerning the probable effects of such conditions on the worker's productiveness and his health, insofar as this is reflected in performance on tests. Psychophysiological tests, which are both reliable and sensitive, should help in detecting incipient conditions of ill health, and thereby help in preventing the development of more serious consequences of unfavorable environments.

One purpose of this report is to describe a new portable reaction time apparatus, and to present data indicative of its usefulness. This new apparatus [2] was constructed principally to time a new type of visual discriminative reaction. But it can also be used to measure simple reaction time, and it can be used to time an easy discriminative reaction.

A second purpose of this study is that of appraising a methodological feature which is new in the measurement of reaction time. It is customary to present a series of discriminations at one level of difficulty. But in the present investigation one group of subjects was required to make easy discriminations and more difficult ones in the same block of trials. For purposes of comparison, another group of subjects was given the test under the usual condition of uniform difficulty. Both the new discrimination and the new method of

[1] From the Industrial Hygiene Research Laboratory, National Institute of Health.

[2] The basic idea and original design for the present apparatus were the product of Dr. John L. Finan (now Major, AGD) while he was Associate Physiologist at the National Institute of Health, early in 1942. Dr. Finan also began the gathering of data to demonstrate the reliability of this test.

presentation were introduced with the idea that automaticity of response would be reduced thereby.

By reducing the automaticity of response, it was hoped that the sensitivity of the test would be increased. In order to examine the sensitivity of the test, it was administered to a group of clinical patients with very mild motor impairments, and to a group of control subjects without such impairments. A reliable difference between these two groups would indicate that the test was of high sensitivity.

In addition to appraising the sensitivity of a test, it is also important to examine its reliability, by which is meant the consistency of the measure when applied to the same individuals at two different times under approximately the same conditions. In the present study, reliability coefficients were determined in the conventional manner.

It is only through such objective appraisals that the probable usefulness of a test can be stated with any degree of accuracy (*4*).

DESCRIPTION OF TEST

This apparatus has six stimulus lights and two response keys. Two lights, a red one on the left and a green one on the right, are placed at the top of an upright panel which the subject faces (fig. 1). Two pairs of lights are placed on the keyboard, one pair back of each response key. The light on the left in each pair is red, and the one on the right is green (figs. 1 and 2). The response keys are depressed disks fastened to the arms of two microswitches which are closed when the subject presses down on the keys.

The present test falls under the head of discriminative reaction time tests. The subject depresses both keys at the beginning of a trial. A "ready" signal is given vocally by the examiner who presents any one of six stimulus patterns 1, 2, or 3 seconds thereafter. Depending upon which pattern is presented, the subject lifts his finger from either the left key or the right one, and his reaction time is recorded by the electric stop clock which is installed at the back of the apparatus so that the subject cannot see it during the test (fig. 2).

There are two different kinds of discriminative reaction which the subject has to make. Stimulus No. 1 and stimulus No. 2 require a very elementary brightness discrimination. A light comes on at the left. The subject raises his finger off the key on the left side. A light comes on at the right. The subject raises his finger off the key on that side. The light on the left is a red one, while the one on the right side is green. But this is not a color discrimination because the subject gets his cue from the position of the light, not its color. The reactions to stimuli Nos. 1 and 2 we have therefore called light-discriminative reactions (L-DR's), and the time required for the reaction, in any trial, will be referred to in this paper as light-discriminative reaction time, or L-DRT.

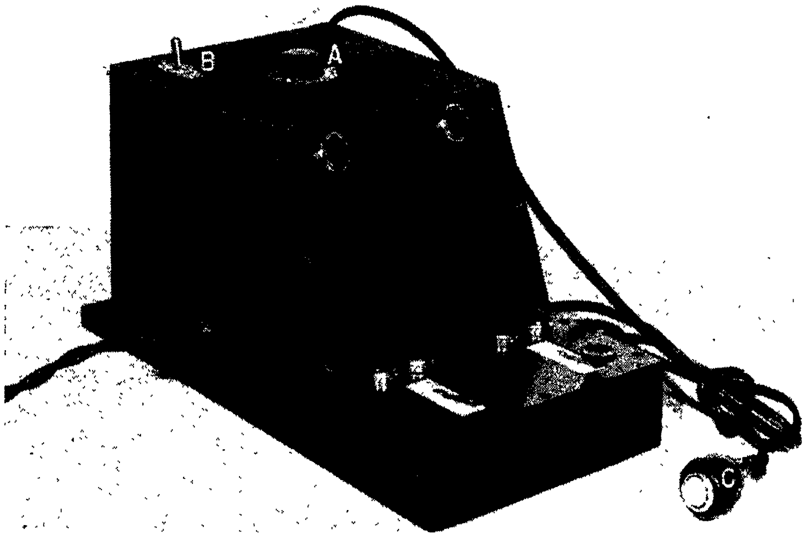

FIGURE 1.—Reaction time apparatus. Front view. A. Rotary switch. Selects stimulus pattern. B. Two-way toggle switch. Selects correct key. C. Push button switch. Turns on stimulus lights, and starts clock.

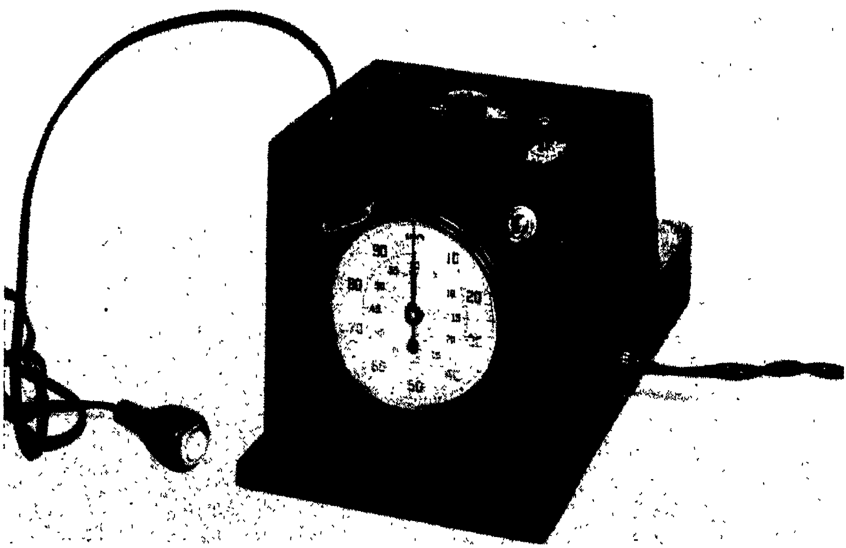

FIGURE 2.—Reaction time apparatus. Rear view, showing stop clock.

Successful response to stimulus patterns 3, 4, 5, and 6 (fig. 3) requires a different kind of discrimination. In this, the colors of the lights are important. Figure 3 shows the four stimulus patterns and the correct response for each of these patterns. Inspection of the diagram reveals the cue for correct response. It is color matching. One top light comes on. It is either red or green. Two bottom lights come on, one on each side. One of these is red, and the other is green. If the top light is red, the subject lifts his finger from the key which is next to a red light on the bottom row. The bottom red light may be on the same side as the top light, i. e., the matching light and

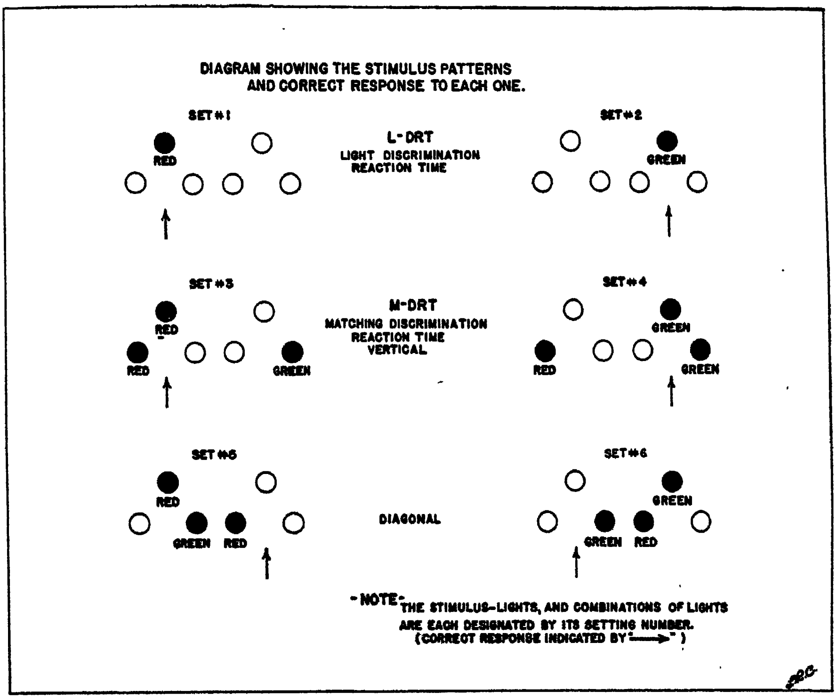

FIGURE 3.—Diagram showing the stimulus patterns and the correct response to each one.

the correct key are vertically placed as in stimulus patterns 3 and 4; or it may be across from it on the opposite side, i. e., the matching light and the correct key are diagonally placed as in stimulus patterns 5 and 6. The subject is correct when he lifts his finger from the key which is nearest to the bottom light matching the top light in color. Reaction time for response to the multilight stimulus patterns we have called matching discriminative reaction time (or M-DRT). Vertical M-DRT refers to the situation in which the matching light and correct key are vertically placed; diagonal M-DRT refers to the situation in which they are diagonally placed.

The test is an easy one to administer. The examiner turns a selector switch (see A, fig. 1) to one of the six numbers. Then he throws the switch (B, fig. 1) forward (for settings Nos. 1, 3, and 6), or backward (for settings Nos. 2, 4, and 5). He is now ready to present the stimulus to the subject, which he does with the pear switch (C in fig. 1). Closing this switch starts the clock and illuminates the stimulus lights simultaneously. The subject stops the clock and turns out the lights by lifting his finger off the correct key. An interval of 5 seconds between trials (the intertrial interval used in the present investigation) allows ample time for the examiner to change settings between trials, and for a record taker to record the RT.

Details of administration.—The subject is seated comfortably before the apparatus. The examiner says, "The test which you are about to take measures the speed with which you can react." The subject is asked to place his forefingers on the keys, and he is shown how much pressure on the keys is needed to just close the switches. The examiner then sets the pointer on the apparatus to the No. 1 setting and presses the button on the pear switch, which turns on the top light on the left side. The subject is told, "Now when you see this light come on, you are to lift your left forefinger from the key as fast as you can. Lift it now, and notice that the light goes out as soon as your finger releases the key." The examiner next sets the pointer to the No. 2 setting, and the subject is asked to lift his right forefinger. The examiner says, "You see, of course, that what you are to do is to lift one of your forefingers just as quickly as you possibly can each time a light comes on. Always lift the finger which is directly below the light which comes on. Your speed of response is measured by this very accurate stop clock at the back of the apparatus." The examiner shows the clock to the subject and explains that it is accurate to one one-hundredth of a second. The subject is asked to press down on the key just released when the examiner says, "Ready," and he is requested not to press down on both keys before the "ready" signal is given.

The examiner observes the reaction of the subject carefully in order to be sure that he releases the correct key, and that he releases only one key, since the release of both keys simultaneously stops the clock.

When the subject understands what he is to do in the L-DRT part of the test, the M-DRT procedure is explained to him. The examiner begins by presenting stimulus pattern No. 3. He says, "Notice the color of the top light which is on. Now lift your finger from the key which is next to the bottom light which matches it." The subject responds, and the examiner corrects him if necessary. The examiner next presents the other stimulus patterns, Nos. 4, 5, and 6. Each time, the examiner gives a "ready" signal and the subject responds to the last three stimulus patterns exactly as he will in the test proper. If the subject depresses both keys before the "ready" signal, or if he

makes an error by releasing the wrong key, or by releasing both keys, the examiner corrects him.

In case the L-DRT trials are to be presented mixed with M-DRT trials, the subject is told to be ready for any one of the six stimuli.

In the present investigations we let subjects "make up" error trials. Whenever a mistake occurred, the examiner said, "Wrong," noted the trial number, and came back to this at a later time during the session. Reaction times were recorded for the correct responses only.

Details of construction.—The apparatus consists of a strongly constructed case made from ½-inch thick plywood, with front and back panels of bakelite. The case, which is mounted on a base 12 inches long, is 6 inches high and 6 inches wide. The front panel is sloped (at an angle of 30° with the vertical) to increase the ease with which top and bottom lights may be viewed simultaneously.

All electrical parts used in construction can be obtained from a radio supply house, with the exception of the rotary selector switch (A, in fig. 1). This switch was designed especially for our RT apparatus. The stationary part of this switch consists of a bakelite disk (diameter 3½ inches) into which are inserted 8 inner contacts and 12 outer contacts arranged in circles (respective radii, ¾ inch and 1¼ inches). Contact arms and their holders and the switch shaft comprise the moveable parts of the switch. Contact arms were screwed to the holder and they were wired through the hollow center of the shaft at the bottom. Switch shaft and contact-arm holder were made as a unit from hard rubber.

A circuit diagram for the apparatus is presented in figure 4. In order to make the diagram easier to follow, the inner ring of contacts is drawn to the side of the outer ring. Actually, G-6 on the inner ring is placed opposite to R-1 on the outer ring in the apparatus.

Switch "B," as shown in figure 1, has been replaced by a General Electric three-way mercury type, No. GE 3010, as this switch is silent in operation.

The six lights used are radio pilot-light brackets, equipped with red and green jewels and 2.5-volt bulbs. All lights are supplied current through a transformer having a 6-volt output and further reduced by a 50-ohm resistor. As lamps G-2 and R-1 are wired direct and not in series they require an additional resistor of 10 ohms each.

Response keys are two microswitches with normally open circuit, and they are equipped with spring leaf actuators on which are secured hard rubber keys.

The circuit is completed by an electric accumulative clock having a 115-volt clutch controlled by a pear-shaped push button, normally open. The clock used in our instrument is one from Standard Electric Time Co., Springfield, Mass., which reads to one one-hundredth of a second.

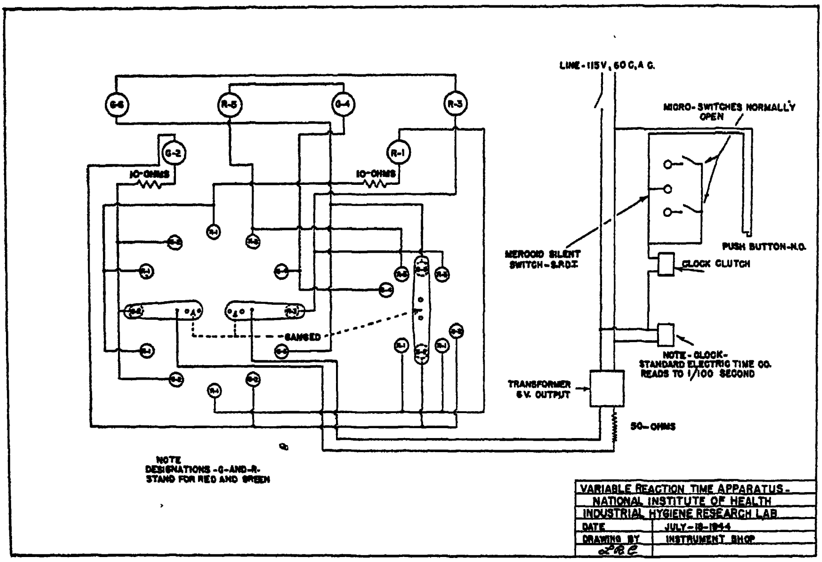

FIGURE 4.—Wiring diagram of the reaction time apparatus.

SUBJECTS

Group I.—Thirty-seven subjects served for one session. Twenty-five trials on L-DRT were given, followed by 40 trials on M-DRT during the same session (condition of separate presentation). The age range for this group was from 17 to 45 years, and the median age was 22 years.

Group II.—Twenty subjects served for 5 sessions under the condition of mixed presentation. That is, 11 trials on L-DRT were presented mixed with 39 trials on M-DRT during each of the 5 sessions. The age range for this group was from 17 to 37 years, and the median age was 21. This group of 20 subjects is divided into 2 subgroups.

Group II-A.—Eleven subjects had also been members of group I during the period from October 27 to October 30, 1943. Thus they had one session of practice with the condition of separate presentation, before their five sessions with mixed presentation, which were given during the period from February 1 to February 13, 1944. The age range for this group was from 17 to 27 years, and the median age was 20.

Group II-B.—Nine subjects had not been tested with this reaction time apparatus previously. The age range for this group was from 18 to 37 years, and the median age was 21.

Group III.—Fifteen subjects served for 1 session under the condition of mixed presentation. Fifty-one trials on L-DRT were presented mixed with 49 trials on M-DRT. The age range for this group was from 26 to 51 years, and the median age was 33. These men were selected to serve as controls for the clinical group.

Clinical group.—In addition to the normal subjects eight ambulatory clinical patients with very mild cases of polyneuropathy served for one session under the same conditions as did the normal subjects in group III. Complaints consisted of paresthesias, sensory losses of distal portions of upper and lower extremities, and mild motor impairment which was less marked than the sensory disturbances. Slight muscular weakness with complete absence of paralysis characterized the motor signs. The age range for this group was from 28 to 47 years, and the median age was 37 years.

Of the 70 male subjects which were used in this investigation, 47 were personnel at the National Naval Medical Center, Bethesda, Md.[3] For the most part these men were medical corpsmen. The other 23 subjects were tested in connection with research investigations which were conducted by the Industrial Hygiene Research Laboratory, National Institute of Health, United States Public Health Service, Bethesda, Md.

RESULTS [4]

There are three points which must be considered whenever the usefulness of a test for the measurement of performance decrement is being considered. These points are (a) practice effect, (b) reliability, and (c) sensitivity.

A practice effect.—Data from group II-B (nine subjects) were used in plotting the practice curves shown in figure 5. This group served for five sessions with mixed presentation of L-DRT and M-DRT. The data were fractionated, so that separate curves could be presented for each of the six different responses.

Figure 5 reveals that after 4 sessions (11 trials per session), further practice appeared not to reduce L-DRT. Likewise, after 3 sessions (19 trials per session) a practice level seemed to have been reached on diagonal M-DRT. But the curves for vertical M-DRT show some slight improvement from session 4 to session 5 (20 trials per session).

It is convenient here to examine the effect of method of presentation upon RT. Notice the single points which are also plotted (see open circles in fig. 5).[5] These points represent the mean RT's for the 37 subjects in group I who took the test under the condition of separate presentation. It is apparent that the L-DRT's were significantly higher under the condition of mixed presentation, while the M-DRT's were lower under this condition. That is, mixing trials on L-DR with trials on M-DR appeared to increase the latencies of the former while decreasing

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[3] Thanks are extended to Lt. Bruce M. Fisher H-V (S) and to Ensign James E. Birren H-V (S) of the Naval Medical Research Institute, Bethesda, Md., for making available to us the data which were obtained from testing the hospital corpsmen. It should also be mentioned that these workers, in the course of their testing, were the first to use the method of "mixed presentation."

[4] Mrs. Gwendolyn Murphy, laboratory technician, assisted with the statistical treatment of the data.

[5] It will be noted that the L-DRT values for group I are plotted opposite session 3 in the figure, although only one session was given to this group. This was done to approximate equality of practice for the two groups. Group I had 25 trials during 1 session, while group II-B had only 11 trials per session.

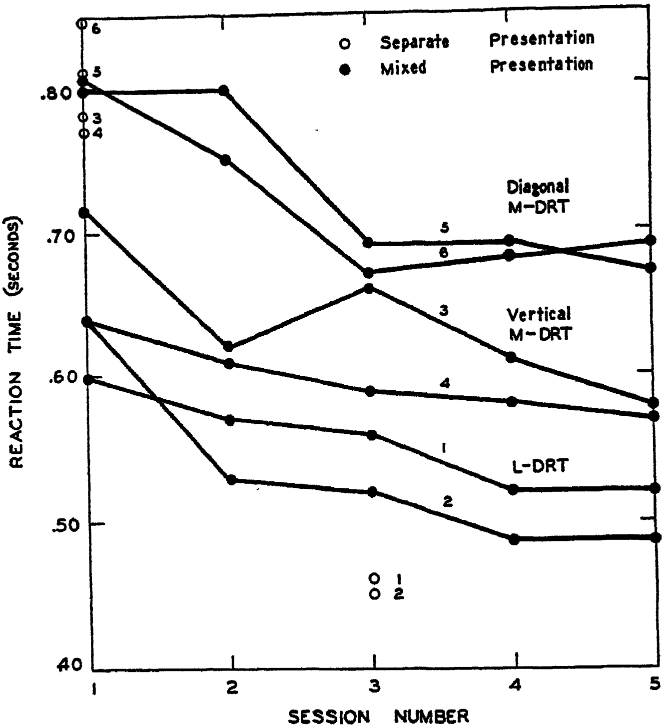

FIGURE 5.—Practice curves. Open circles represent reaction times obtained with the method of separate presentation. Nos. 1 to 6 refer to the particular discriminations, or setting numbers. (See fig. 3.)

the latencies of the latter. Such a decrease was found in all four of the M-DRT's (reactions 3, 4, 5, and 6), but the most marked decreases were in vertical M-DRT, in which the only statistically reliable difference was found (response No. 4).[6]

The increase in L-DRT, which occurs under the method of mixed presentation, can be explained in terms of such factors as expectancy, ocular characteristics of the task, and inhibition. But the decrease in vertical M-DRT does not appear to be explainable at the present time.

Expectancy.—Under the condition of mixed presentation, expectancy is less unified than it is under the condition of separate presentation. On the assumption that divided attention leads to longer latencies than unified attention (*6*) it would be predicted that L-DRT's and M-DRT's would be longer under the condition of mixed presentation. Actually, however, the data show no increase in M-DRT from condition to condition. Indeed, as we have noted, vertical M-DRT appears to decrease. Although increased division of attention may be partly responsible for the increase in L-DRT under the condition of mixed presentation, the same explanation obviously cannot be used to account for the decrease in vertical M-DRT.

Ocular characteristics of the task.—It is probable that ocular components of the L-DR are different under the two conditions of presentation. Under the condition of separate presentation the subject presumably fixates a point in line with and about midway between the two unilluminated top lamps, during the prepara-

[6] It is interesting to note, in addition, that the diagonal M-DRT's appear to be longer than the vertical M-DRT's under both conditions, although the difference is greatest under the condition of mixed presentation; and, as would be expected, the L-DRT's are shortest.

tory interval. Without changing his fixation point he could respond to the light which would fall on his retina near the fovea. Under the condition of mixed presentation, on the other hand, the subject presumably fixates a lower point, and consequently the retina would be stimulated at a point farther from the fovea under this condition. It is possible, further, that some subjects may glance downward in making the discrimination between L-DR and M-DR. With these considerations in mind, it may be reasonably argued that the increased latency for L-DR under the condition of mixed presentation is due, at least partially, (1) to appearance of the stimulus farther in the periphery of the retina. The latency of a simple reaction to a standard visual stimulus presented in the periphery of the retina may be as much as 44 percent greater than the latency of reaction to the same stimulus presented in the fovea (*2*). (2) Eye movements downward. The increase in L-DRT, we found, roughly approximates the mean ocular latencies for such eye movements (*1, 5*). These are points which could be settled only through direct measurements of the positions and movements of the eyes during testing.

It is quite possible, then, that visual factors are involved in the increased latency of L-DR under the condition of mixed presentation. It is also likely that these factors help to explain why diagonal M-DRT is longer than vertical M-DRT. Response to peripheral stimulation and necessity for eye movements would seem to characterize diagonal M-DR more than they do vertical M-DR, because in the diagonal M-DR the matching stimuli are more widely separated. But the decrease in vertical M-DRT obviously requires some other explanation.

Inhibitory factors.—It was very easy to find an explanation for the increase in L-DRT in terms of expectancy and in terms of ocular factors. This result does not present any difficulty, either, for an explanation in terms of inhibitory factors. Under the condition of mixed presentation there are possibilities for inhibition of correct response, which do not exist under the condition of separate presentation. One inhibition derives from rewarding the response to the unilluminated top light (correct response for diagonal M-DRT). Reinforcement of this response provides interference to the correct L-DR. Another inhibition derives from punishment of the response to the illuminated top light (incorrect response in diagonal M-DR). Both inhibitions would act to increase L-DRT.

Just as the decrease in vertical M-DRT remained unexplained in terms of set and ocular factors, so it does not appear to be explainable in terms of inhibitory factors either.

(*B*) *Reliability.*—Table 1 presents the reliability coefficients which were obtained in the present study. Odd-even reliability coefficients were obtained for both conditions of presentation; but test-retest coefficients could be computed for only one condition, the condition of mixed presentation.[7] The obtained product-moment r's were used to compute the Spearman-Brown predicted values for a test length of 50 trials; and these corrected r's were used in drawing the conclusions which follow.

Considering the odd-even r's it would appear that the reliability of L-DRT is higher under the condition of mixed presentation than it is under the condition of separate presentation (r's were 0.94 and 0.84);

[7] Because 11 of the 20 subjects whose data were used for the test-retest correlations had had a previou session under the condition of separate presentation, while the other 9 subjects had had no previous ex perience with this test, no correlations except those involving performance during sessions 4 and 5 were presented in table 1. The inequalities in practice level between the 2 subgroups within group II were, of course, minimal during the last 2 sessions.

TABLE 1.—*Reliability coefficients*

	Odd-even reliability					
	Light-discriminative reaction time			Matching-discriminative reaction time		
	Number of subjects	Number of trials	Coefficient of correlation	Number of subjects	Number of trials	Coefficient of correlation
Separate presentation	37	25	0.56 [1](.84)	37	40	0.79 [1](.90)
Mixed presentation	15	51	.89 [1](.94)	15	49	.82 [1](.90)
	Test-retest reliability [2]					
Mixed presentation	20	11	.82 [1](.95)	20	39	.74 [1](.79)

[1] Spearman-Brown values for test length of 50 trials in parentheses.
[2] Session 4 with session 5, mixed presentation.

but M-DRT appears to be equally reliable under both conditions (r's were 0.90 and 0.90).[8] Considering both the odd-even r's and the test-retest r's, L-DRT seems more reliable than M-DRT when the condition of mixed presentation is used. Odd-even reliabilities were close: 0.94 for L-DRT and 0.90 for M-DRT, but the test-retest reliability was distinctly higher for L-DRT (0.95 for L-DRT, as compared to 0.79 for M-DRT).

From this it would appear that the most reliable measure is L-DRT, when obtained under the condition of mixed presentation. Odd-even and test-retest r's were higher than 0.90. Such high reliability is a strong recommendation for the use of this measure. The next thing to be considered is its sensitivity.

(*C*) *Sensitivity.*—In order to examine the sensitivity of the test, it was administered to a clinical group of 8 patients with very mild cases of peripheral polyneuropathy, and to a control group of 15 normal subjects. The 2 groups were approximately matched with respect to age. These clinical patients showed no obvious motor incoordination, nor any easily detectable "slowing down" in motor function. Nevertheless, their subjective complaints suggested that such disturbances might be shown upon careful examination with sensitive tests.

The subjects were given 51 trials on L-DRT and 49 trials on M-DRT. The method of mixed presentation was used. The results which were obtained are shown in table 2. This table shows that the clinical patients were very much slower in their reactions than were the control subjects. Statistically, the differences are very reliable

[8] Actually, even under the condition of "separate" presentation, degree of difficulty probably was not uniform throughout the M-DR's, because diagonal M-DRT appears to be more difficult than vertical M-DRT.

TABLE 2.—*Comparison between polyneuropathic subjects and normal subjects, mean RT scores, differences, and reliabilities of the differences* [1]

	Reaction time in 0.01 second					
	Clinical group	Control group	Difference	t	n	P
Light-discriminative reaction time	85.63	55.73	29.90	5.85	21	<0.001
Matching-discriminative reaction time	121.70	75.56	46.14	4.30	19	<0.001

[1] Method of mixed presentation used.

(P <0.001). Both L-DRT and M-DRT are shown to be quite sensitive measures, but the t for L-DRT is somewhat higher than that for M-DRT, indicating that L-DRT may be slightly more sensitive.

It might reasonably be supposed that, due to their illness, the clinical patients would be poorly motivated, and almost any test of reaction speed would reveal a difference between their performance and that of normals. However, this supposition was not supported by the results obtained with the Kent-Shakow Formboards (*3*). It was not possible to give the K-S test to all the clinical subjects. But it so happened that the four slowest patients [9] (by our DRT test) were among those to whom the K-S test was given. The average "dexterity" score for these four subjects was at the sixth decile, which means that they did slightly better than the "normal" individual on this test. It would appear from this that low motivation cannot account for the poor scores of the patients on the DRT test. Another indication in the same direction is that the number of erroneous responses was not greater for the clinical group.[10]

These negative results with the K-S test further emphasize the sensitivity of the DRT test. The indication is that the DRT test promises to be useful in detecting mild impairments which cannot be detected with clinical instruments like the K-S test.

SUMMARY

A new portable reaction time apparatus is described. With this apparatus it is possible to time simple reaction, easy discriminative reactions, and more difficult discriminative reactions to light stimuli. The more difficult discriminations involve the matching of colored lights, and these responses are new in the study of reaction time.

A methodological feature, also new in reaction time measurement, was introduced in the present investigation. That is, we required the subject to make easy discriminations and more difficult discriminations in the same series of trials.

[9] Ages were 28, 33, 35, and 41.

[10] M-DRT data from one subject in theclin ical group and from one subject in the control group were rejected because of excessivee rror scores. These rejections were valid according to Scarborough's rule for rejection of observations and measurements (7). The clinical subject made 22 errors; the control subject made 27 errors. The other subjects in the clinical group had error scores ranging from 2 to 10; the other controls had error scores ranging from 2 to 8.

The new RT test and the new method are appraised in terms of reliability and sensitivity. Mixed presentation of easy items and hard items together appears to be a more reliable method than the customarily used method in which level of difficulty remains constant throughout one block of trials.

The new RT test appears to be sensitive in detecting slight impairments in motor performance, and thus holds promise of usefulness in the clinic and for the general purpose of measuring performance decrement.

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THE GEOGRAPHICAL DISTRIBUTION OF ROCKY MOUNTAIN SPOTTED FEVER AND NUTTALL'S COTTONTAIL IN THE WESTERN UNITED STATES [1]

By Wm. L. Jellison, *Sanitarian, United States Public Health Service*

It has long been suspected that Rocky Mountain spotted fever may have its reservoir in some mammal or mammals that are natural hosts of its tick vectors, i. e., *Dermacentor andersoni* Stiles in the western United States, *Dermacentor variabilis* (Say) in the eastern United States, and *Amblyomma americanum* (L.) in some of the South Central and Southeastern States. Positive statements regarding such a reservoir and names of specific animals have been published but convincing evidence has not been presented.

In this paper a very close relationship between the distribution of one species of cottontail, *Sylvilagus nuttallii*, and the distribution of spotted fever in the western United States will be demonstrated, suggesting that this species of animals may be important in the epidemiology of spotted fever in this part of the country and possibly the reservoir or one of the reservoirs of the virus in nature.

[1] From the Rocky Mountain Laboratory, Hamilton, Mont., Division of Infectious Diseases, National Institute of Health.

The range of this cottontail as given by Nelson (*3*) [2] roughly coincides with the main spotted fever endemic area in the western United States as mapped by Philip (*6*), which includes parts of 12 States.

These States include 519 counties, of which 290, or 55.88 percent, are within the range of this rabbit. Of the 7,546 cases of spotted fever recorded at the Rocky Mountain Laboratory up to 1942 (*4*), in which the counties of origin are given, 7,514 cases, or 99.58 percent, occurred in counties within the range of the cottontail rabbit, *S. nuttallii*. For the 12 States listed, the number of cases of spotted fever occurring in counties in which the cottontail rabbit is found, compared with the number of cases occurring in counties in which the cottontail is not found, is as follows: Washington 69:1, Oregon 1,097:3, California 153:2, Montana 1,613:2, Idaho 1,895:9, Nevada 301:0, Wyoming 1,691:0, Utah 262:3, Colorado 383:7, New Mexico 9:0, North Dakota 8:2, and South Dakota 33:3. Almost every county in Montana, Idaho, Nevada, Wyoming, and Utah is within the range of this rabbit so the high proportions of cases in counties within the range of the cottontail are less significant than the proportions from other States.

This study does not take into consideration the scattered cases of spotted fever in Arizona, Arkansas, Iowa, Louisiana, Minnesota, Missouri, Nebraska, Oklahoma, and Texas, or the main spotted fever endemic area in the States east of the Mississippi River where other species of cottontails are present. The few reported Canadian cases, with one possible exception, are within the known range of this rabbit. The genus *Sylvilagus* is represented in Brazil by *S. brasiliensis*. *Sylvilagus* is one of the few North American genera of mammals to extend into Brazil, where Brazilian spotted fever, known also as São Paulo typhus, has been reported. Other species of this genus occur in Colombia, South America, and the State of Sinaloa, Mexico, where diseases presumably identical with spotted fever have been reported.

The cottontail rabbit, *S. nuttallii*, is an important host of the immature stages of the wood tick, *D. andersoni*, and is one of the few mammals that is host to all stages of this tick. It has been found susceptible to the virus of spotted fever; it occurs in great numbers within its range; and otherwise meets the qualifications of a mammalian reservoir of a disease. Spotted fever infection has never been recovered from this host or any other mammal in nature in the highly endemic area in the western United States.[3]

[2] More recent information on the distribution of Nuttall's cottontail has also been used, and its presence in certain counties of western Montana and northern Idaho beyond the previously known range of the species has been established by collections made during the fall of 1944 by the writer.

[3] There is a report of the probable isolation of spotted fever from a pocket gopher, *Geomys breviceps dutcheri*, in Oklahoma by Hassler, Sizemore, and Robinson, in a paper read before the American Epidemiological Society, Baltimore, Md., Mar. 20, 1942, but not published. The data were discussed later by Parker, Kohls, and Steinhaus (*5*).

It is a conspicuous fact that not only does the distribution of the Rocky Mountain wood tick, *D. andersoni*, vector of spotted fever in the western United States, closely coincide with the range of the cottontail, *S. nuttallii*, but that each of the other three species of *Dermacentor* known to parasitize small mammals has a distribution coincidental with a species of rabbit. These relationships are as follows: The eastern wood tick, *D. variabilis*, and the eastern cottontail, *S. floridanus;* the Pacific Coast *Dermacentor*, *D. occidentalis* Marx, and the Pacific Coast brush rabbit, *S. bachmani;* and the rabbit *Dermacentor*, *D. parumapertus* Neumann, and the black-tailed jack

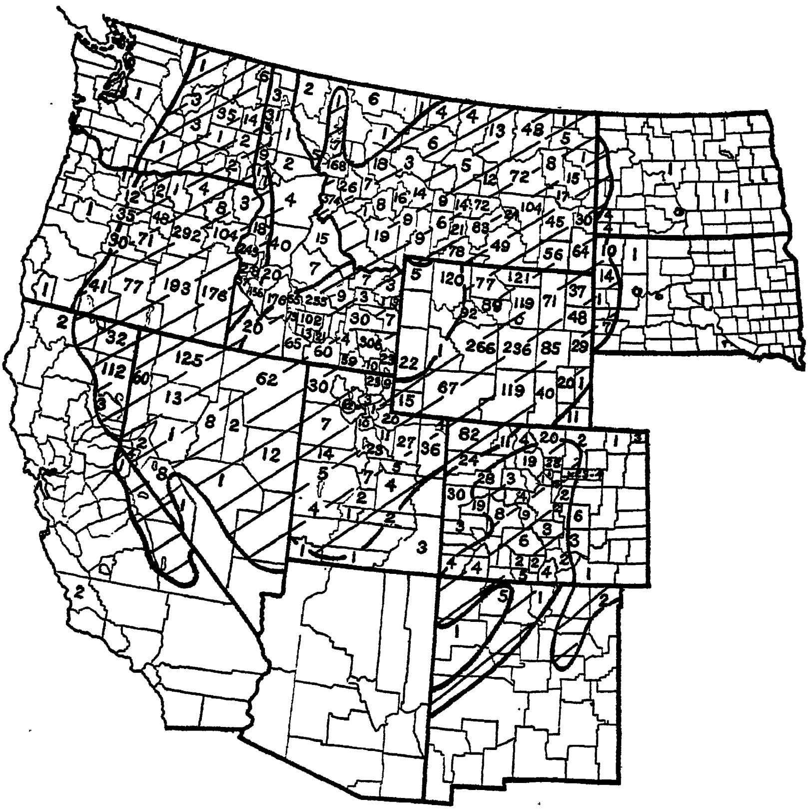

FIGURE 1.—Hatching indicates distribution of Nuttall's cottontail. Numbers indicate spotted fever cases by county, recorded up to 1942. States covered are: Washington, Oregon, Idaho, California, Nevada, New Mexico, Wyoming, Colorado, Utah, Montana, North Dakota, and South Dakota.

rabbit, *Lepus californicus*. The only marked exception in these distribution relationships in the United States, where the ranges of the several species of *Dermacentor* have been mapped by Cooley (*1*), is an area on the Pacific Coast where *D. variabilis* is present beyond the native range of the eastern cottontail. In this area, *D. variabilis* is much scarcer than *D. occidentalis*. Kohls (*2*) by collection and

rearing secured 5,880 adult specimens of *Dermacentor* from Oregon and California, of which only one was identified as *D. variabilis;* the others were *D. occidentalis* with a few *D. parumapertus*. In Canada, *D. andersoni* apparently extends northward into British Columbia and Alberta beyond the known range of the Rocky Mountain cottontail.

Figure 1 illustrates the relationship between the distribution of *Sylvilagus nuttallii* and the distribution of cases of spotted fever. Hatching indicates distribution of *Sylvilagus nuttallii* and numbers indicate cases of spotted fever recorded at the Rocky Mountain Laboratory up to 1942.

SUMMARY

A close geographical association exists between spotted fever and Nuttall's cottontail in the western United States. In 12 western States, 99.58 percent of the spotted fever cases occur within the range of this rabbit, which is present in 55.88 percent of the counties. Other species of cottontails are present in all States or countries where spotted fever has been recognized.

ACKNOWLEDGMENT

Dr. E. R. Hall of the Museum of Zoology, University of Kansas, has aided in mapping the distribution of cottontails and has supplied published and unpublished records supplementary to those given by Nelson (*3*).

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INCIDENCE OF HOSPITALIZATION, JUNE 1945

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	June	
	1944	1945
1. Number of plans supplying data	71	81
2. Number of persons eligible for hospital care	13,584,432	18,151,008
3. Number of persons admitted for hospital care	134,792	182,128
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	121.1	122.1
5. Incidence per 1,000 persons, annual rate for the 12 months ended June 30	105.2	104.7
6. Number of plans reporting on hospital days	19	31
7. Days of hospital care per case discharged during month [1]	7.26	8.05

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

DEATHS DURING WEEK ENDED JULY 21, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 21, 1945	Corresponding week, 1944
Data for 91 large cities of the United States:		
Total deaths	7,654	7,722
Average for 3 prior years	8,152	
Total deaths, first 29 weeks of year	265,885	269,761
Deaths under 1 year of age	540	603
Average for 3 prior years	623	
Deaths under 1 year of age, first 29 weeks of year	17,559	17,859
Data from industrial insurance companies:		
Policies in force	67,386,739	66,657,503
Number of death claims	13,284	12,127
Death claims per 1,000 policies in force, annual rate	10.3	9.5
Death claims per 1,000 policies, first 29 weeks of year, annual rate	10.7	10.3

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED JULY 28, 1945

Summary

A total of 391 cases of poliomyelitis was reported for the current week as compared with 369 for the preceding week—an increase of only 22 cases as compared with 115 during the preceding week and 172 for the corresponding week last year. The 5-year median for the week is 303, and for the same week last year 740 cases were reported. Of the current cases, 282 occurred in 11 States reporting 10 or more cases each, as follows (last week's figures in parentheses): *Increases*—Connecticut 11 (3), New York 72 (46), Pennsylvania 16 (12), Ohio 14 (8), Tennessee 29 (20), Oklahoma 12 (9); *decreases*—Massachusetts 13 (14), New Jersey 32 (37), Virginia 22 (28), Texas 40 (62), California 21 (25). Currently, 275 cases, or 70 percent, occurred in the Middle Atlantic, South Atlantic, and South Central areas. For the corresponding week last year, 654 cases, or 88 percent of the total, occurred in the Middle Atlantic, East North Central, South Atlantic, and East South Central areas. The cumulative figure through the week ended July 7 was 1,425, as compared with 1,290 for the same period last year. For the 3 weeks since that date, 1,014 cases have been reported, as compared with 1,770 for the corresponding weeks last year.

A total of 111 cases of meningococcus meningitis was reported, as compared with 114 last week and a 5-year median of 54. The total to date is 5,881, as compared with 12,609 for the corresponding period last year, and a 5-year median of 2,242.

Current totals reported for diphtheria, scarlet fever, Rocky Mountain spotted fever, and endemic typhus fever are slightly above the respective 5-year medians, while those for measles, smallpox, typhoid and paratyphoid fever, and whooping cough are below.

A total of 8,344 deaths was recorded for the week in 93 large cities of the United States, as compared with 7,698 last week, 7,971 for the corresponding week last year, and a 3-year (1942–44) average of 7,977. The total to date is 276,164, as compared with 279,883 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended July 28, 1945, and comparison with corresponding week of 1944, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944	
NEW ENGLAND												
Maine	0	0	0	------	------	------	3	10	20	0	1	1
New Hampshire	0	0	0	------	------	------	1	4	4	1	1	0
Vermont	0	0	0	------	------	------	6	4	20	0	0	0
Massachusetts	4	2	2	------	------	------	115	115	178	5	6	2
Rhode Island	0	1	1	------	8	------	1	11	31	2	3	0
Connecticut	0	1	1	1	------	------	12	17	44	1	3	0
MIDDLE ATLANTIC												
New York	5	7	7	[1] 2	[1] 2	[1] 4	42	190	355	8	25	10
New Jersey	1	1	1	2	2	2	20	58	183	2	8	4
Pennsylvania	7	9	7	------	------	------	169	85	85	10	11	2
EAST NORTH CENTRAL												
Ohio	5	2	3	1	1	2	13	11	43	6	4	1
Indiana	1	5	4	1	------	3	4	8	12	1	4	1
Illinois	5	4	8	2	3	5	129	32	77	8	8	2
Michigan [2]	12	4	1	------	------	------	95	49	133	4	10	1
Wisconsin	2	3	3	------	8	7	42	150	280	3	1	1
WEST NORTH CENTRAL												
Minnesota	14	1	1	------	------	1	6	13	13	2	4	0
Iowa	1	3	1	------	------	------	11	40	28	1	1	1
Missouri	0	3	2	------	------	------	18	6	8	5	6	2
North Dakota	0	0	1	------	------	------	0	0	4	1	0	0
South Dakota	0	2	1	------	------	------	1	2	2	0	0	0
Nebraska	3	7	1	1	2	1	11	3	8	1	1	0
Kansas	6	0	1	------	------	------	11	14	28	0	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	0	1	0	0	0
Maryland [2]	10	1	1	------	------	1	9	4	27	0	5	3
District of Columbia	0	0	0	------	------	------	0	6	6	1	3	1
Virginia	5	0	3	39	32	45	7	13	35	2	4	2
West Virginia	4	0	2	15	------	2	3	4	5	2	3	3
North Carolina	7	10	7	------	------	------	3	59	21	3	4	1
South Carolina	24	3	4	73	72	87	9	16	15	0	3	2
Georgia	3	2	5	1	54	11	0	10	7	2	1	0
Florida	1	4	3	------	1	3	12	63	12	4	5	0
EAST SOUTH CENTRAL												
Kentucky	4	4	3	------	------	------	15	9	10	0	2	1
Tennessee	2	1	1	6	5	11	2	8	8	2	1	0
Alabama	16	6	4	------	4	4	4	13	19	9	5	3
Mississippi [2]	8	7	3	------	------	------	0	------	------	0	3	0
WEST SOUTH CENTRAL												
Arkansas	4	0	0	2	14	14	4	4	4	1	3	0
Louisiana	3	15	4	1	3	3	2	11	3	4	1	1
Oklahoma	2	4	2	14	1	6	10	5	5	1	0	0
Texas	45	29	27	372	197	187	82	88	88	7	12	2
MOUNTAIN												
Montana	1	1	0	3	------	------	1	1	11	0	0	0
Idaho	1	1	0	6	------	------	36	0	4	0	0	0
Wyoming	0	1	1	------	------	5	1	8	8	0	0	0
Colorado	4	4	4	15	------	14	11	11	16	1	0	0
New Mexico	4	1	1	3	2	1	18	3	9	0	1	0
Arizona	1	4	1	29	12	23	5	7	25	0	0	0
Utah [2]	0	0	0	------	------	------	95	25	25	0	0	0
Nevada	0	0	0	------	------	------	0	0	2	0	0	0
PACIFIC												
Washington	11	5	3	1	------	------	76	41	41	4	5	0
Oregon	1	5	1	------	3	3	25	17	33	1	2	1
California	20	11	10	1	7	24	354	482	292	6	29	6
Total	247	174	150	591	433	436	1,494	1,730	2,999	111	191	54
30 weeks	7,565	6,195	6,915	68,898	337,289	167,969	98,605	587,804	531,495	5,881	12,609	2,242

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended July 28, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944		July 28, 1945	July 29, 1944	
NEW ENGLAND												
Maine	6	0	0	9	13	7	0	0	0	1	0	1
New Hampshire	2	1	0	4	0	0	0	0	0	0	0	0
Vermont	2	0	0	2	4	0	0	0	0	0	0	1
Massachusetts	13	8	1	32	38	48	0	0	0	1	4	1
Rhode Island	0	0	0	0	1	1	0	0	0	0	0	0
Connecticut	11	3	2	5	8	8	0	0	0	1	0	0
MIDDLE ATLANTIC												
New York	72	237	10	212	80	73	0	0	0	5	11	10
New Jersey	32	3	3	15	16	16	0	0	0	2	0	3
Pennsylvania	16	64	5	69	52	52	0	0	0	14	4	7
EAST NORTH CENTRAL												
Ohio	14	40	7	51	66	50	0	0	0	8	8	8
Indiana	2	20	8	12	18	15	0	0	0	2	4	4
Illinois	3	15	6	37	31	41	0	0	0	0	3	7
Michigan [2]	8	30	7	115	33	35	3	0	0	6	1	5
Wisconsin	0	6	1	32	37	33	0	1	0	1	1	0
WEST NORTH CENTRAL												
Minnesota	0	8	2	22	30	18	0	0	0	0	1	0
Iowa	2	4	2	9	42	11	0	0	0	0	1	1
Missouri	2	0	0	11	12	12	0	0	0	5	1	4
North Dakota	0	0	0	1	4	3	0	0	0	1	1	0
South Dakota	0	0	0	1	4	2	0	1	0	0	0	0
Nebraska	0	1	1	8	6	3	0	0	0	0	0	0
Kansas	4	9	8	24	14	15	0	0	0	1	1	2
SOUTH ATLANTIC												
Delaware	0	1	0	0	1	2	0	0	0	0	0	0
Maryland [2]	8	17	1	22	13	9	0	0	0	3	0	1
District of Columbia	5	4	0	5	5	4	0	0	0	1	0	0
Virginia	22	39	3	19	20	13	0	0	0	4	2	8
West Virginia	1	5	3	24	19	12	0	0	0	3	8	5
North Carolina	2	57	3	13	11	11	0	2	0	3	16	7
South Carolina	7	2	2	4	4	3	0	0	0	6	4	10
Georgia	4	8	4	7	10	10	0	0	0	10	10	16
Florida	6	3	1	3	0	3	0	0	0	18	3	3
EAST SOUTH CENTRAL												
Kentucky	3	79	11	19	11	16	0	0	0	6	8	15
Tennessee	29	10	10	10	6	11	0	0	0	6	4	9
Alabama	9	13	6	8	0	10	0	0	0	3	6	9
Mississippi [2]	1	1	1	6	2	3	1	0	0	9	8	8
WEST SOUTH CENTRAL												
Arkansas	0	0	2	2	8	1	0	0	0	6	6	11
Louisiana	6	11	3	1	2	3	0	0	0	2	6	13
Oklahoma	12	3	4	14	2	6	0	0	0	3	4	9
Texas	40	8	8	26	23	15	0	0	0	15	27	29
MOUNTAIN												
Montana	1	1	1	5	9	4	0	0	0	2	2	0
Idaho	0	0	0	4	8	3	0	0	0	1	0	0
Wyoming	2	0	0	0	6	3	0	0	0	0	0	0
Colorado	1	0	0	16	12	12	0	0	0	6	0	2
New Mexico	0	0	1	3	2	2	0	0	0	1	0	3
Arizona	1	1	0	2	4	2	0	0	0	0	0	3
Utah [2]	11	2	2	3	6	4	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	9	1	1	17	22	8	0	0	0	4	1	1
Oregon	1	12	4	6	10	4	0	0	0	0	1	1
California	21	13	13	103	94	45	0	0	0	6	6	6
Total	391	740	303	1,013	819	706	4	4	5	166	163	246
30 weeks	2,439	3,060	1,526	132,165	145,388	95,462	259	287	602	2,299	2,747	3,362

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately, as follows: Massachusetts, 1; Ohio, 1; Michigan, 4; Maryland, 3; Georgia, 1; Florida, 1; Arkansas, 7; Texas, 1; Montana, 1.

Telegraphic morbidity reports from State health officers for the week ended July 28, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended July 28, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	July 28, 1945	July 29, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	51	24	25	0	0	0	0	0	0	0	1
New Hampshire	2	0	0	0	0	0	0	0	0	0	0
Vermont	21	33	23	0	0	0	1	0	0	0	3
Massachusetts	140	66	126	1	27	0	0	0	0	0	1
Rhode Island	0	6	6	0	0	0	0	0	0	0	0
Connecticut	71	52	57	0	13	0	0	1	0	0	3
MIDDLE ATLANTIC											
New York	378	174	279	4	15	0	3	0	0	1	13
New Jersey	195	84	115	0	1	0	1	0	0	0	3
Pennsylvania	244	94	293	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL											
Ohio	192	172	267	0	0	1	1	0	0	0	4
Indiana	25	9	27	1	0	0	1	0	0	0	3
Illinois	165	72	146	1	0	0	0	1	0	0	10
Michigan [2]	143	81	262	4	0	0	0	0	0	0	1
Wisconsin	87	135	186	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL											
Minnesota	10	29	46	0	0	0	0	0	0	0	1
Iowa	17	8	31	0	0	0	0	0	0	0	0
Missouri	45	15	22	0	0	0	0	0	2	0	5
North Dakota	3	10	10	0	0	0	0	0	0	0	0
South Dakota	0	10	5	0	0	0	0	0	0	0	1
Nebraska	4	29	19	0	0	0	0	0	0	0	0
Kansas	41	33	71	0	0	0	0	1	2	0	7
SOUTH ATLANTIC											
Delaware	8	0	1	0	0	0	0	0	0	0	1
Maryland [2]	76	90	90	0	0	5	0	5	0	0	1
District of Columbia	10	0	12	0	0	0	0	0	0	0	0
Virginia	99	92	68	0	0	292	0	8	0	1	5
West Virginia	46	28	28	0	0	0	0	3	0	0	0
North Carolina	189	246	117	0	4	0	0	3	0	1	1
South Carolina	67	67	67	0	59	0	0	0	0	4	0
Georgia	17	13	16	1	4	1	0	0	1	35	1
Florida	15	18	19	0	1	0	0	0	0	6	0
EAST SOUTH CENTRAL											
Kentucky	52	87	76	0	0	0	0	0	0	0	0
Tennessee	33	34	40	0	0	0	1	0	0	2	2
Alabama	33	14	23	1	0	0	0	1	0	30	4
Mississippi [2]	-------	0	-------	0	0	0	0	0	0	9	2
WEST SOUTH CENTRAL											
Arkansas	12	14	16	1	40	0	0	1	11	0	2
Louisiana	1	1	5	3	0	0	0	0	0	5	0
Oklahoma	14	3	16	0	3	0	0	0	4	0	1
Texas	213	164	232	13	532	10	0	0	0	57	15
MOUNTAIN											
Montana	7	37	24	0	0	0	0	0	1	0	2
Idaho	9	1	6	0	0	1	0	1	0	0	3
Wyoming	1	5	8	0	0	0	0	0	0	0	0
Colorado	62	27	28	0	0	0	0	2	0	0	7
New Mexico	4	2	9	0	0	3	0	0	0	0	0
Arizona	19	21	10	0	0	30	0	0	0	0	0
Utah [2]	23	72	78	0	0	0	0	1	0	0	0
Nevada	0	2	0	0	0	0	0	0	1	0	0
PACIFIC											
Washington	34	30	36	0	0	0	0	0	0	0	2
Oregon	25	12	15	0	0	0	0	0	0	0	2
California	212	85	231	2	2	0	15	0	1	0	3
Total	3,115	2,301	3,693	32	701	343	23	28	23	151	115
Same week 1944	2,301	-------	-------	48	745	313	8	22	11	251	76
Average, 1942-44	3,267	-------	-------	54	531	379	11	[4] 22	14	[4] 120	-------
30 Weeks, 1945	76,405	-------	-------	1,077	14,308	4,219	228	259	479	2,137	2,844
1944	56,565	-------	-------	954	12,080	4,264	331	284	355	2,079	2,077
Average, 1942-44	97,105	-------	[4] 112,867	935	8,478	3,704	317	[4] 284	498	[4] 1,391	-------

[2] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 21, 1945

This table lists the reports from 86 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	1	0	0	0	0
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	6	0	0	0
Vermont:												
Barre	0	0	------	0	2	0	0	0	0	0	0	0
Massachusetts:												
Boston	0	0	------	0	33	1	11	3	13	0	1	51
Fall River	0	0	------	0	0	0	0	0	0	0	0	4
Springfield	0	0	------	0	1	0	0	0	5	0	0	0
Worcester	0	0	------	0	26	0	6	0	2	0	0	3
Rhode Island:												
Providence	0	0	------	0	0	1	1	0	1	0	0	4
Connecticut:												
Bridgeport	0	0	------	0	0	1	0	0	0	0	1	0
Hartford	0	0	------	0	1	0	0	0	1	0	0	0
New Haven	0	0	------	0	0	1	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	2	6	1	0	0	8
New York	6	0	2	1	46	10	34	13	34	0	4	132
Rochester	0	0	------	0	0	0	1	5	2	0	0	6
Syracuse	0	0	------	0	0	0	1	0	5	0	0	58
New Jersey:												
Camden	0	0	------	0	2	0	2	1	2	0	0	3
Newark	0	0	------	0	5	1	0	2	2	0	0	17
Trenton	0	0	------	0	0	0	3	11	1	0	0	0
Pennsylvania:												
Philadelphia	0	0	------	0	62	0	7	6	11	0	1	95
Pittsburgh	3	1	------	1	0	1	6	0	5	0	1	24
Reading	0	0	------	0	0	0	1	0	0	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	4	1	9	2	2	0	0	8
Cleveland	0	0	2	0	3	1	5	1	7	0	0	76
Columbus	0	0	------	0	1	0	0	1	4	0	0	5
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	0	0	0	0
Indianapolis	2	0	------	0	1	1	4	0	1	0	1	3
South Bend	0	0	------	0	0	0	0	0	1	0	0	2
Terre Haute	0	0	------	0	0	0	0	0	2	0	0	2
Illinois:												
Chicago	1	0	------	0	139	2	15	1	30	0	0	45
Springfield	0	0	------	0	0	0	1	1	0	0	0	2
Michigan:												
Detroit	6	0	------	0	44	2	4	1	29	0	0	71
Flint	0	0	------	0	1	0	3	0	3	0	0	1
Grand Rapids	0	0	------	0	0	0	1	0	3	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	4	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	8	1	0	0	9	0	0	0
Racine	0	0	------	0	0	0	0	0	1	0	0	9
Superior	0	0	------	0	2	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	1	0	0	3	0	0	1
Minneapolis	0	0	------	0	0	1	0	0	10	0	0	2
St. Paul	0	0	------	0	2	1	2	0	3	0	0	5
Missouri:												
Kansas City	0	0	------	0	6	0	9	0	8	0	1	7
St. Joseph	0	0	------	0	1	0	0	0	1	0	0	0
St. Louis	1	1	1	1	1	6	9	3	0	0	4	30

City reports for week ended July 21, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	1	0	0	0	0	0	0	0
Nebraska:												
Omaha	0	0	------	0	0	0	0	1	7	0	0	0
Kansas:												
Topeka	0	0	------	0	0	0	0	0	3	0	0	2
Wichita	0	0	------	0	0	0	3	0	3	0	0	11
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	2	0	0	0	0	0	0	0
Maryland:												
Baltimore	0	0	------	0	2	1	6	1	4	0	0	72
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	1	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	0	4	9	4	0	0	10
Virginia:												
Lynchburg	0	0	------	0	0	0	0	1	0	0	0	0
Richmond	0	0	------	0	0	0	1	2	1	0	2	0
Roanoke	1	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	1	0	0	0	0	4
Wilmington	0	0	------	0	0	1	0	0	0	0	0	6
Winston-Salem	0	0	------	0	0	0	0	0	0	0	0	6
South Carolina:												
Charleston	0	0	------	0	0	0	0	0	0	0	0	1
Georgia:												
Atlanta	0	0	------	0	0	1	2	0	1	0	0	5
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	3	0	2	0	1	0	0	2
Nashville	0	0	------	0	0	0	0	1	0	0	0	2
Alabama:												
Birmingham	0	0	------	0	0	0	4	1	0	0	0	4
Mobile	0	0	------	0	0	1	1	0	0	0	1	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	0	0	0	0
Louisiana:												
New Orleans	4	0	2	1	0	0	5	2	0	0	3	2
Shreveport	0	0	------	0	0	0	3	3	0	0	0	0
Texas:												
Dallas	0	0	------	0	2	0	0	5	3	0	0	10
Galveston	0	0	------	0	0	0	0	2	0	0	0	2
Houston	0	0	------	0	0	0	5	6	1	0	0	1
San Antonio	1	0	------	0	0	0	2	5	1	0	1	0
MOUNTAIN												
Montana:												
Billings	1	0	------	0	0	0	2	0	0	0	0	0
Great Falls	0	0	------	0	2	1	0	0	1	0	0	0
Helena	0	0	------	0	2	0	0	0	1	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	1	0	4	0	5	1	4	0	0	25
Pueblo	0	0	------	0	0	0	0	0	0	0	0	2
Utah:												
Salt Lake City	0	0	------	0	25	0	1	1	1	0	0	4

City reports for week ended July 21, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	31	0	4	0	4	0	0	11
Spokane	0	0	------	0	1	1	0	0	0	0	0	0
Tacoma	0	0	------	0	19	0	0	0	0	0	0	7
California:												
Los Angeles	2	0	1	0	25	3	2	2	16	0	0	22
Sacramento	1	0	------	0	2	0	0	0	4	0	0	3
San Francisco	1	0	------	0	57	1	8	4	8	0	0	4
Total	32	2	9	4	573	43	202	105	277	0	21	900
Corresponding week, 1944	41	------	5	7	475	------	225	------	231	0	33	730
Average, 1940-44	40	------	23	[1]7	[2]1,020	------	[1]236	------	269	0	31	1,090

[1] 3-year average 1942-44.
[2] 5-year median 1940-44.

Dysentery, amebic.—Cases: Nashville, 1; San Antonio, 1; Los Angeles, 3.
Dysentery, bacillary.—Cases: Providence, 1; New York, 1; Cleveland, 6; Detroit, 1; St. Louis, 3; Charleston, S. C., 12; Los Angeles, 3.
Dysentery, unspecified.—Cases: Newark, 1; Baltimore, 1.
Leprosy.—Cases: San Francisco, 1.
Rocky Mountain spotted fever.—Cases: New York, 1; Philadelphia, 1; Wichita, 1; Washington, 1; Richmond, 1.
Typhus fever, endemic.—Cases: Wilmington, N. C., 1; Mobile, 1; New Orleans, 3; Shreveport, 1; Dallas, 1; Houston, 4; San Antonio, 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 86 cities in the preceding table (estimated population, 1943, 34,054,200)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	0.0	0.0	165	10.5	49.7	10.5	73	0.0	5.2	165
Middle Atlantic	4.2	0.5	0.9	0.9	53	5.6	26.4	20.4	29	0.0	2.8	160
East North Central	5.5	0.0	1.2	0.0	126	4.9	26.1	4.3	56	0.0	0.6	139
West North Central	2.0	2.0	2.0	2.0	22	17.9	45.8	8.0	76	0.0	9.9	115
South Atlantic	1.8	0.0	0.0	0.0	7	5.4	27.2	23.6	20	0.0	3.6	189
East South Central	0.0	0.0	0.0	0.0	18	5.9	41.3	11.8	6	0.0	5.9	47
West South Central	14.3	0.0	5.7	2.9	6	0.0	45.9	66.0	14	0.0	11.5	43
Mountain	16.5	0.0	8.3	0.0	273	8.3	66.0	16.5	58	0.0	0.0	256
Pacific	7.9	0.0	1.6	0.0	214	7.9	22.1	9.5	51	0.0	0.0	74
Total	4.9	0.3	1.4	0.6	88	6.6	31.0	16.1	43	0.0	3.2	138

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 7, 1945.—During the week ended July 7, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		8		32	203	45	23	133	64	508
Diphtheria		6	4	18		5		3		36
Dysentery, bacillary				14						14
German measles		2		6	45	2	5	39	8	107
Influenza		7			27				5	39
Measles		1		90	120	13	17	90	85	416
Meningitis, meningococcus					1			1	1	3
Mumps		1		41	49	23	13	47	8	182
Poliomyelitis				2	2			1	1	6
Scarlet fever	2	4	11	30	36	12	4	10	8	117
Tuberculosis (all forms)		1	7	216	21	11	1	17	40	314
Typhoid and paratyphoid fever			1	9			2	1		13
Venereal diseases:										
Gonorrhea	1	15	10	141	114	46	32	29	47	435
Syphilis		11	4	114	65	11	4	2	23	234
Other forms	1			1						2
Whooping cough			9	73	36	4	1	17	1	141

CHINA

Notifiable diseases—March 1945.—During the month of March 1945, certain notifiable diseases were reported in China as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	816	92	Scarlet fever	66	10
Cholera	7	2	Smallpox	468	45
Diphtheria	66	12	Typhoid fever	511	44
Dysentery	871	18	Typhus fever	477	40
Relapsing fever	973	20			

CUBA

Habana—Communicable diseases—4 weeks ended June 23, 1945.—During the 4 weeks ended June 23, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	5		Tuberculosis	10	
Diphtheria	16		Typhoid fever	33	3

Provinces—Notifiable diseases—4 weeks ended June 16, 1945.—During the 4 weeks ended June 16, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			4	8		11	23
Chickenpox		5			2	5	12
Diphtheria		24	1		1		26
Hookworm disease				1			1
Leprosy	1	1		1		1	4
Malaria	2	4		10		14	30
Measles		1	1			21	23
Poliomyelitis						1	1
Tuberculosis	6	20	24	20	26	17	113
Typhoid fever	25	104	31	121	44	31	356
Typhus fever	1						1

[1] Includes the city of Habana.

FINLAND

Notifiable diseases—May 1945.—During the month of May 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	33	Mumps	586
Chickenpox	579	Paratyphoid fever	311
Conjunctivitis	13	Pneumonia (all forms)	2,560
Diphtheria	1,233	Poliomyelitis	34
Dysentery	15	Puerperal fever	31
Gastroenteritis	2,267	Rheumatic fever	271
Gonorrhea	1,887	Scabies	3,066
Hepatitis, epidemic	666	Scarlet fever	390
Influenza	749	Syphilis	373
Laryngitis	27	Typhoid fever	50
Malaria	148	Vincent's angina	35
Measles	178	Whooping cough	2,876

JAMAICA

Kingston—Influenza.—Information dated June 23, 1945, stated that a mild form of influenza was reported in Kingston, Jamaica. It was stated that since June 1, 1945, about 60 or 70 percent of the population of Kingston were suffering from an attack of influenza. Due to the epidemic the Jamaica Base Command declared Kingston "off limits" to all military personnel except those on official business.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

British East Africa—Kenya—Nyeri District.—During the week ended July 21, 1945, 13 cases of plague with 5 deaths were reported in Nyeri District, Kenya, British East Africa.

Egypt.—For the week ended June 23, 1945, 13 cases of plague were reported in Egypt. For the period July 12–18, 1945, 3 cases of plague with 2 deaths were reported in Port Said, Egypt, and for the week ended May 26, 1945, 5 cases of plague were reported in Ismailiya, Egypt.

Morocco (French).—For the period July 1–10, 1945, 38 cases of plague were reported in French Morocco. On July 23, 1945, 1 case of suspected plague was reported in Casablanca, French Morocco.

Smallpox

Morocco (French).—For the period July 1–10, 1945, 287 cases of smallpox, including 275 cases in the region of Fez, were reported in French Morocco.

Union of South Africa.—For the period June 1 to July 2, 1945, 26 cases of smallpox were reported in Johannesburg. In Alexandria, since the beginning of the outbreak up to June 11, 1945, 69 cases of smallpox were reported. The cases reported are said to be of the virulent type. Vaccination is being carried on.

Typhus Fever

Algeria.—Typhus fever has been reported in Algeria as follows: June 11–20, 1945, 26 cases, including 7 cases reported in Algiers; June 21–30, 1945, 16 cases including 13 cases in Algiers.

Bulgaria.—For the period May 1–27, 1945, 159 cases of typhus fever were reported in Bulgaria.

Egypt.—For the week ended June 23, 1945, 339 cases of typhus fever with 62 deaths were reported in Egypt.

Morocco (French).—For the period July 1–10, 1945, 136 cases of typhus fever were reported in French Morocco, including 6 cases in Casablanca, 2 cases in Fez, 15 cases in Marrakesh, 3 cases in Meknes, and 1 case in Rabat.

Sweden.—For the month of May 1945, 192 cases of typhus fever, including 81 cases in Malmo, were reported in Sweden.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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BIRTH STATISTICS AS AN INDEX OF INTERDEPENDENCE OF COUNTIES WITH REGARD TO MEDICAL SERVICES [1]

By ANTONIO CIOCCO, *Principal Statistician*, and MARION E. ALTENDERFER, *Assistant Statistician, United States Public Health Service*

INTRODUCTION

Data are presented in this paper to illustrate how birth statistics may be employed to describe quantitatively the pattern of the dependence of some counties upon the medical facilities of other counties. It is well known that city, county, or even State lines do not constitute barriers to the movement of persons seeking medical care. As a result, it becomes difficult to measure accurately the medical resources of a specified locality, and the ratios of physicians, hospital beds, nurses, or other facilities relative to the number of persons in the population often become meaningless. One may find that, relative to population size, a locality has many physicians, hospital beds, or other facilities; and yet these resources are barely sufficient because they serve also the populations of adjoining places. Conversely, one may find that in a community with relatively few medical resources the demands of the population for medical care are satisfied because use is made of the facilities of nearby places.

To obtain a correct picture of the medical resources available to a community, certain adjustments must be made in the statistics of both the population and the medical facilities of the community. If the facilities of a community are utilized by persons in surrounding places, the population and facilities of these localities should be grouped with those of the original community before ratios of facilities to population are computed. In essence this means that, for the purposes of comparative analysis, political boundaries should be disregarded and localities regrouped into "medical trade" areas (*1*).

For these operations knowledge is required about the pattern of the supply and demand for medical care. This knowledge should be based on quantitative information about the number of persons who receive medical care in an area and the number who go outside the area for medical care.

[1] From the Division of Public Health Methods.

Data of this kind are not generally available and can be obtained only through special surveys. For example, from questionnaires sent to all physicians and to all general hospitals in Washington, D. C., in 1942, it was found that 15 percent of the patients seen by physicians of that city were residents of surrounding counties of Maryland and Virginia, and 25 percent of the general hospital admissions also came from these counties (*2*). It was thus possible to estimate that the population served by the physicians of Washington was 975,000 persons and not the city's population of 820,000. The use of this type of survey to determine quantitatively the intercommunity movement of patients is costly and time-consuming. It becomes impractical when the maintenance of current records for the study of trends and changes in the intercommunity movement is desired.

While there are no Nation-wide data on the intercommunity movement of persons seeking all kinds of medical care, birth and death statistics are available. Birth and death certificates include the usual place of residence of the individuals as well as the place of occurrence of the event. From analysis of these certificates one can derive information on the number of persons in a community who go to another locality to have babies or to receive care for a serious illness, and also the changes which take place from year to year in such movements.

The main objective of the intercommunity movement relative to births and deaths is to take advantage of medical facilities, such as hospitals and specialists, lacking in the place of residence but available elsewhere. It is reasonable to assume then that the size and direction of the movement will furnish an index of the degree of dependence of one locality upon the medical facilities of another. The determination of this index and of some of the variables associated with it forms the substance of this paper.

MATERIAL AND METHOD

Data on the frequency with which births and deaths of residents of a stated locality occur in the place of residence or elsewhere were published by the Bureau of the Census for the years 1937 to 1939 by State, county, and city (*3*). These data do not indicate the place where the births or deaths actually took place outside of the place of residence. They do not provide, therefore, information on the direction of the movement of persons obtaining medical care outside of their own county. However, from these published figures it can be learned that there is a high correlation between the proportions of births and deaths occurring outside the county of residence. For example, in 1939 the correlation between the percentage of births occurring outside the resident county and the corresponding percent-

age of deaths is measured by a correlation coefficient $r=0.79\pm0.08$ for the counties of Maryland and $r=0.54\pm0.08$ for the counties of Ohio. Because there is high correlation it would seem that one or the other of the two kinds of data could be used. Because there are more births than deaths it was decided to limit this study to an analysis of birth statistics.

To obtain information on the specific place where the births to residents took place, when they occurred outside the county of residence, special tabulations were requested from the Bureau of the Census. It was decided to limit the study to 1942, the most recent year for which the Bureau of the Census had the required information available for analysis. Because of the limitations of time and personnel only 8 States were used: Georgia, Kansas, Maryland, Massachusetts, Ohio, Oregon, Tennessee, and Virginia. These States include at least 1 from each of the 4 principal geographic areas of the country. According to the 1940 Census, they include 19 percent of the total population, 20 percent of the urban population, 18 percent of the white population, and 13 percent of the land area of the country. They also accounted for 19 percent of the effective buying income [2] of the country in 1942. Eighteen percent of the non-Federal general hospital beds were situated in these States in 1943. Their average birth rate in 1942 was 21.6 per 1,000 persons as compared with 21.3 for the country as a whole. It is evident then that except for density of population these 8 States together are fairly representative of the 48 States.

In the above States there were recorded for 1942, 533,363 births to residents, of which 60,695 occurred outside the county of residence. As expected, the hospitalization rate for births occurring outside the county of residence was high, 94 percent. In these same States the percentage of all births hospitalized equalled only 68 percent.

Two ratios are used in this paper to describe the pattern of the movement of persons from one county to another with reference to confinement. The first will be called the in-residence birth ratio and abbreviated as the I. R. ratio. The I. R. ratio for a county is obtained by dividing the number of births to residents which occurred within the county by the total births occurring to residents. The second ratio will be called the specific out-residence birth ratio and abbreviated as the O. R. ratio. Each O. R. ratio for a county is obtained by dividing the number of births to residents which occurred in a specific outside county by the total births occurring to residents.

The I. R. and the O. R. ratios are both expressed as the number of such births per 100 resident births. The sum of the specific O. R. ratios based on the resident births of a county is the complement of the

[2] Effective buying income is defined by Sales Management as income from all sources plus an estimated nonmoney income of farmers and small-town residents (4).

I. R. ratio of that county. For example, the I. R. ratio for Carroll County, Md., is 53. The specific O. R. ratios for Carroll are: to Baltimore City 18, to Frederick County 6, to York County, Pa., 16, and to other places 5. The sum of these specific O. R. ratios is 47, the complement of the I. R. ratio.

DISTRIBUTION OF COUNTIES BY I. R. RATIOS

In table 1 is shown the proportion of counties having stated I. R. ratios in the 8 States studied. When all the States are taken together it appears that 30 percent of the 621 counties had an I. R. ratio of 95 or higher. That is, in only 30 percent of the counties did 95 percent or more of the births to residents take place within the county of residence. These findings indicate how extensive is the movement across county boundaries for purposes of obtaining care for childbirth. In the remaining 70 percent of the counties 5 percent or more of the births to residents occurred outside the county of residence, and in 31 percent of the counties over 15 percent of the births took place outside the county of residence.

TABLE 1.—*Distribution of counties in eight States by in-residence birth (I. R.) ratio*

I. R. ratio	Total 8 States	State							
		Georgia	Kansas	Maryland	Massachusetts	Ohio	Oregon	Tennessee	Virginia
Number of counties [1]	621	159	105	24	14	88	36	95	100
		Percent distribution							
Total	100	100	100	100	100	100	100	100	100
95 or higher	30	46	16	25	21	18	17	38	25
85-94	39	40	20	17	43	39	41	60	40
75-84	14	11	23	25	15	22	11	2	16
50-74	12	3	26	21	21	18	17	0	14
less than 50	5	0	15	12	0	3	14	0	5

[1] The independent city of Baltimore is counted as a separate county. The 24 independent cities of Virginia have been combined with the counties in which they are located.

There is considerable variation among the eight States with regard to the value of the I. R. ratio in the constituent counties. The counties of Georgia and Tennessee, for example, have comparatively high I. R. ratios, and the variation is small. On the other hand, there is wide variation in the I. R. ratios of the counties of Kansas and many of the ratios are comparatively low. On the whole, the data would appear to indicate marked intercounty movement of patients in the latter State and comparatively little movement in the former two States.

Among the factors associated with the variation of the I. R. ratios of counties there are two which will be examined: the medical facilities of the counties, as measured by the number of general hospital beds relative to population (*5*), and their economic level as measured

by the annual per capita effective buying income (*4*). The mean I. R. ratio of the counties is found to increase from 80.3 for counties with no general hospital beds to 92.9 for counties with 3 or more hospital beds per 1,000 persons. Thus, the greater the hospital facilities the larger is the percentage of persons who stay in their counties of residence to have babies.

The relationship of the I. R. ratio to economic level as measured by per capita income brings out another aspect of the phenomenon.

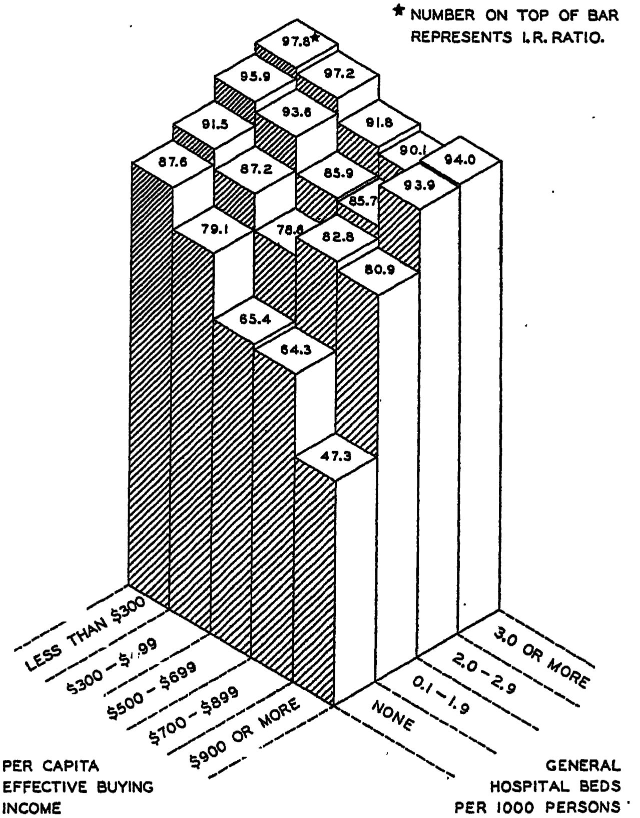

FIGURE 1.—Average in-residence birth (I. R.) ratios of counties in 8 States grouped by per capita effective buying income and general hospital beds per 1,000 persons, 1942.

For counties with low income, under $300 per capita, the mean I. R. ratio equals 88.9. It decreases to 84.1 for counties with $300 to $499 income, and to 76.0 for the $500 to $699 group. Then it begins to increase consistently and reaches 90.4 for the group of counties with an average per capita income of $900 or more. Therefore, higher I. R. ratios are found in the wealthiest and the poorest counties.

A more illuminating picture of the relationship of the I. R. ratio to the economic level and the medical facilities of the counties is shown in figure 1 where all three variables have been diagrammed.

Figure 1 illustrates that, for each income level, the I. R. ratio increases rather regularly with increase in the number of general hospital beds per 1,000 persons. However, the rate of increase in the I. R. ratio for the counties in the lowest income group is very small.

The results presented in figure 1 show that only for the group of counties with no general hospitals is there consistent increase in I. R. ratios as the income level decreases. On the basis of these findings one can generalize that a low I. R. ratio is associated with a comparatively high income and no medical facilities; a high I. R. ratio, on the other hand, may be found in counties that have medical facilities and also in counties where the income level of the population is low. In other words, people stay in their own county to have babies either when they are too poor to go elsewhere or when there are hospital facilities available; they go outside their counties when the income level is high and there are few hospital facilities in the county.

DIRECTION AND DISTANCE OF INTERCOUNTY MOVEMENTS

The I. R. ratio or its complement, the sum of the specific O. R. ratios, is a measure of the amount of out-movement of patients, but in order to measure the direction of the movement the specific O. R. ratios will have to be examined. Of the 439 counties that have an I. R. ratio of less than 95, 296 have at least one specific O. R. ratio of 5 or more. That is, in 67 percent of the counties which show substantial out-movement, at least 5 percent of the resident births occur in one or more specific counties. In the remaining 143 counties the out-movement is diffused, and less than 5 percent of the resident births occur in a particular outside county.

The movement from the 296 counties with specific O. R. ratios of 5 or more is frequently in the direction of more than one county. These 296 counties accounted for 376 specific O. R. ratios. This finding emphasizes again how extensive is the interdependence of counties with respect to medical services and the importance of arriving at a clear notion of its magnitude. This interdependence is not limited by State lines. Of the 376 specific O. R. ratios, 122 are from counties bordering on other States. Thirty-eight of these movements (31 percent) are across State lines. In addition, 5 inter-State movements originated in counties which do not border on other States.

Adequate data to measure the distances involved in the intercounty movements are not available since the specific place of residence was indicated very infrequently. This is understandable because in general a movement is from the rural portions of a county. An estimate of the variations in the amount of travel taking place in these movements may be obtained by measuring the distances from

the place of occurrence to either the nearest or farthest border of the county of residence. The former will give the minimum and the latter the maximum distance involved. The true distance lies somewhere between the two and probably closer to the minimum value than to the maximum. Therefore, in this study, an index of the distance involved in the movement was determined by the distance between the place of occurrence and the nearest border of the county of residence. When more than one community in a county was designated as the place of occurrence the distance was measured from the one nearest the proximate border of the county of residence.

TABLE 2.—*Distribution of intercounty movements by distance from place of occurrence to county of residence*

	Total	Distance in miles						
		Under 7.5	7.5–12.4	12.5–17.4	17.5–22.4	22.5–27.4	27.5–32.4	32.5 and over
Number of intercounty movements	309	90	89	60	26	18	5	21
Percent distribution	100	29	29	19	8	6	2	7

Table 2 shows the distribution of these estimates for the 309 intercounty movements for which the exact place of occurrence was known. It will be seen that there is considerable variation in the estimated distances. Thus, in 29 percent of the movements the minimum distance involved was 7.4 miles or less, but in 7 percent it was greater than 32.5 miles. For 15 percent of the movements the minimum distance travelled amounted to 22.5 miles or more. The distances for the individual States are not shown in the table but appear to vary from State to State depending upon size of counties and density of population. For example, in Oregon, for approximately half of the movements the distance involved was 22.5 miles or more, while in Massachusetts the estimated distance in any movement did not exceed 7.5 miles.

DETERMINATION OF CENTERS OF MEDICAL SERVICE

There are two purposes in studying the intercounty movement of patients. The first is to obtain a measure of the interdependence of counties with regard to medical services. The second is to identify the counties which are centers for dispensing medical services and the counties which are dependent upon these centers. With regard to births the I. R. and specific O. R. ratios serve both as a measure of interdependence and as a means of identification of centers. The map shown in figure 2 illustrates this for the counties of Maryland.

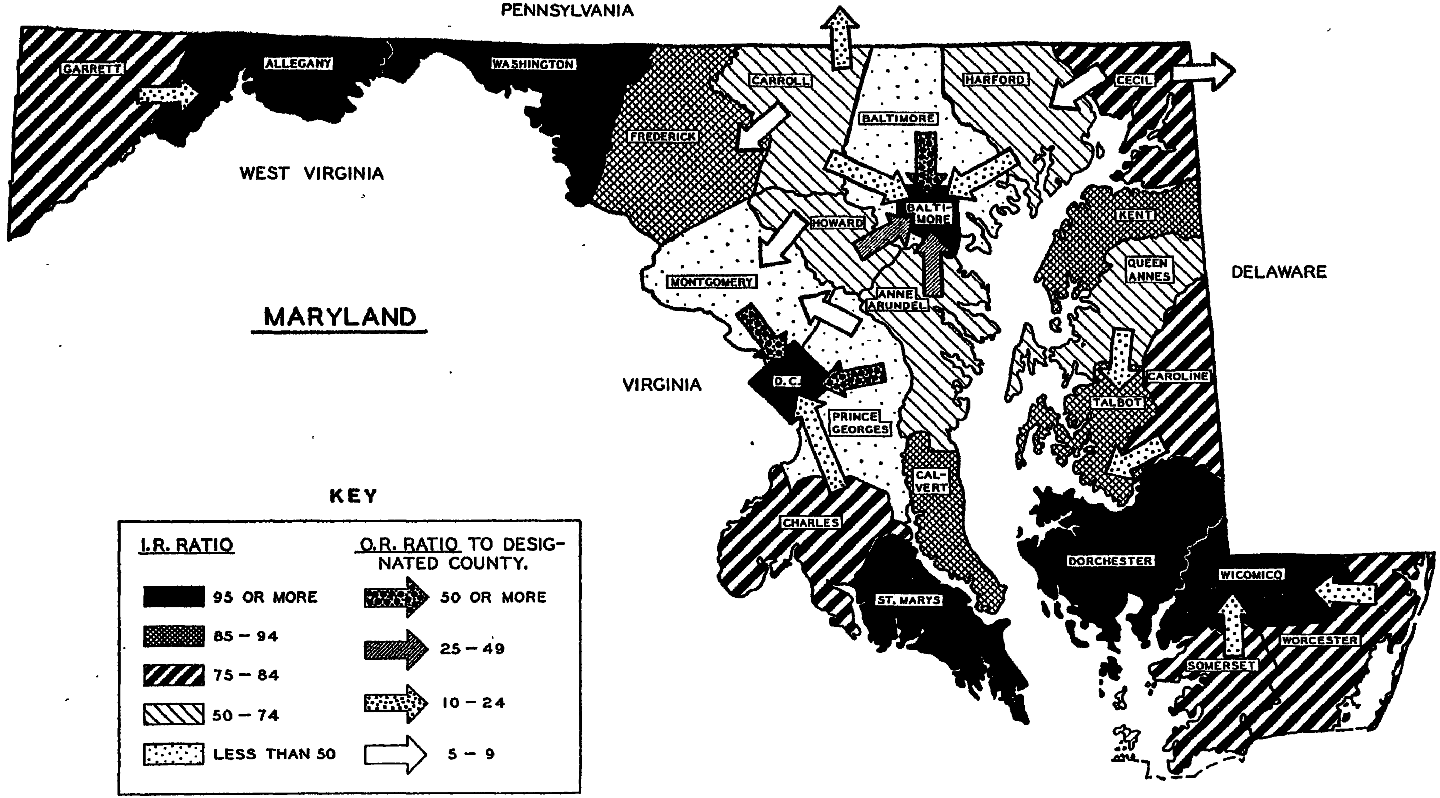

FIGURE 2.—Counties of Maryland showing percent of births to residents occurring within the resident county (I. R. ratio) and the direction and magnitude of the movement to other counties (O. R. ratio).

The data shown in figure 2 indicate that, so far as the other counties of the State are concerned, Dorchester, St. Marys, and Washington exhibit little in- or out-movement. Allegany, Frederick, Talbot, and Wicomico counties and Baltimore City show only in-movement. Harford and Montgomery show both in- and out-movement. Although Calvert and Kent counties have I. R. ratios of less than 95, they do not have any specific O. R. ratios of 5 or more. The remaining 12 counties have I. R. ratios of less than 95 and show only out-movement.

In terms of interdependence of counties, the four counties and Baltimore City which show only in-movement are localities on which other counties depend in varying degree for their medical care. These localities may be considered as "centers." Baltimore City is a center on which depend Ann Arundel, Baltimore, part of Carroll, Harford, and Howard counties. Allegany is a center for Garrett, Frederick for part of Carroll, Talbot for Queen Annes and Caroline, Wicomico for Somerset and Worcester. Although Washington, D. C., is not being discussed here it should be noted that it is a center for three Maryland counties: Montgomery, Prince Georges, and Charles.

The counties which show only out-movement may be regarded as "dependent." The residents of a dependent county sometimes utilize the medical facilities of more than one center. For example, Carroll County sends patients to Pennsylvania as well as to Baltimore City and Frederick County.

The counties which have I. R. ratios of 95 or more and show no in-movement are here called "independent." So far as these data show, the independent counties are neither dependent upon another county nor serve as a source of medical care for other counties. It will be noted, recalling figure 1, that an independent county may have sufficient resources of its own, or have few resources and a population which does not go beyond the county borders for medical care. The three counties mentioned illustrate both situations.

Two counties, Calvert and Kent, have I. R. ratios of less than 95 and yet the out-movement of patients does not seem to be directed toward any one county. We shall call these "nonspecific dependent" counties.

Harford and Montgomery counties depend upon other counties for a good proportion of the medical care relative to births, but at the same time they extend medical care to other counties to some degree. These counties which show both in- and out-movement will be differentiated from other dependent counties by the term "partially dependent."

From the findings illustrated in figure 2 a number of pertinent considerations are in order. In the first place, it is seen again that the interdependence of counties is not limited by State lines. Secondly, even within counties part of the population may go toward one

center and part toward another. Furthermore, in counties whose medical resources serve other counties one finds that the resident population sometimes seeks medical care elsewhere. If in delineating areas dependent upon a center it is necessary to retain county lines it is well to recognize the possibility of error introduced. It is obvious, however, that such an error is unimportant in comparison to the more realistic evaluation of the medical resources available to the population which results from delineation of areas according to the above determination of the centers and their dependent counties.

Among the 621 counties of the 8 States studied there are 114 (18 percent) that can be classified as centers according to the above definition, and 101 (16 percent) that can be classified as independent. That leaves 406, or about two-thirds of the counties of this sample, that are dependent to some degree or manner on other counties. There is considerable variation from State to State in the proportion of counties which are centers, independents, or dependents. In Tennessee and Virginia only 14 percent of the counties are centers while in Kansas 24 percent fall into this category. Independent counties account for only 3 percent of the counties in Kansas and Ohio and for 31 percent of the counties in Georgia. The proportion of counties which are dependent upon other counties for medical services to some degree or manner varies from 53 percent in Georgia to 75 percent in Oregon.

It is expected that the dependency status of a county is related to the economic level of the county and the amount of its medical facilities. This is borne out by the data presented in tables 3 and 4. The centers are wealthier than the other counties and contain more facilities. Amost half the independent counties are in the lowest income group. Two-fifths of them have no general hospitals. These two facts point to a means of identifying counties the populations of which neither possess adequate medical facilities nor have the means to seek them elsewhere.

TABLE 3.—*Distribution of different types of counties by per capita effective buying income*

Per capita effective buying income	Type of county: Centers	Independent	Dependent	Nonspecific dependent	Partially dependent
Number of counties	114	101	[1] 254	110	41
	Percent distribution				
Total	100	100	100	100	100
Less than $300	11	49	36	39	0
$300-$499	14	34	26	27	22
$500-$699	16	4	26	13	39
$700-$899	26	10	10	10	34
$900 and over	33	3	2	11	5

[1] Baltimore County income data not available.

TABLE 4.—*Distribution of different types of counties by number of general hospital beds per 1,000 persons*

General hospital beds per 1,000 persons	Type of county				
	Centers	Independent	Dependent	Nonspecific dependent	Partially dependent
Number of counties	114	101	255	110	41
	Percent distribution				
Total	100	100	100	100	100
None	4	41	77	55	15
0.1–1.9	14	26	17	19	34
2.0–2.9	27	17	4	13	31
3.0 or more	55	16	2	13	20

Another characteristic of the data presented in tables 3 and 4 is the variability of each type of county in terms of per capita income and hospital beds. Not all the centers are wealthy and have more resources than all of the other kinds of counties. Being a center or any other type county is related to the facilities available in surrounding counties. A county with 1 hospital bed per 1,000 surrounded by counties that have none will probably be a center. A county with 3 beds per 1,000 may be dependent on an adjoining county if the latter possesses 6 beds per 1,000.

There are some centers shown in table 4 as having no general hospital beds. Several factors, including the presence of unregistered or Federal hospitals,[3] explain this movement of people seeking medical facilities into counties which apparently have no general hospitals.

MEDICAL SERVICE AND TRADE CENTERS

In view of the economic characteristics of the medical service centers described above it seems worth while to inquire in what manner they coincide with commercial trade centers. For this purpose use has been made of the counties containing the marketing and business centers identified on the Rand-McNally Trading Area Map of the United States.

The relationship between the two types of centers is shown in table 5, from which it appears that all of the 14 "major trade centers" are also medical service centers. Of the 55 "basic trade centers," 39 are also medical service centers, and 5 are independent. Thus only 20 percent of the basic trade centers are not medical service centers or independent counties. On the other hand, 61 of the 114 counties defined here as centers, and 96 of 101 independent counties are included among

[3] In Georgia, 567 births to residents of Muscogee County were hospitalized in Chattahoochee County. Although this county has no registered non-Federal general hospital it has a large station hospital at Fort Benning.

"other" counties. This latter group of counties is the Rand-McNally equivalent of dependent counties as defined in this paper.

TABLE 5.—*Comparison of Rand-McNally trade centers and centers of medical service relative to births*

Rand-McNally classification	Type of county (relative to births)				
	Total	Centers	Independent	Dependent	Other
	Number of counties				
Major trade centers	14	14	0	0	0
Basic trade centers	55	39	5	2	9
Other counties	552	61	96	253	142
	Percent distribution				
Major trade centers	100	100	0	0	0
Basic trade centers	100	71	9	4	16
Other counties	100	11	17	46	26

From these findings it appears that there is association between trade centers and medical service centers. However, this correlation is not exact. In seeking medical care a population follows established commercial trade routes but areas around a trade center are much more extensive than those around a medical service center. This inference is supported by computing the number of counties dependent upon medical service centers and upon trade centers. The 14 major trade centers have 458 dependent counties, or an average of 32.7 dependent counties per center. These same 14 counties as medical service centers have an average of 4.8 dependent counties each. Similarly, the 39 basic centers have 217 dependent counties or an average of 5.6 counties each. These same 39 counties have an average of 2.5 dependent medical service counties. Thus, the trade area concept may be used to determine broadly the areas of medical service, but the use of the I. R. and O. R. ratios allows a finer determination of the pattern of intercounty movement of persons seeking medical care with reference to births.

SUMMARY

Data on the place of occurrence of births have been used as indices (a) to measure the amount and direction of the movement of persons across county lines for purposes of obtaining medical care for childbirth, and (b) for identifying counties which are centers of such medical services and those which are dependent upon these centers. Statistics of births which occurred in 1942 to residents of eight States that together are fairly representative of the whole country have been analyzed.

From this analysis the main findings are:

1. The average income of the population and the relative number of general hospital beds are closely associated with the intercounty movement of population relative to births. There is very little movement either when the income and amount of hospital facilities are high or when they are both low. With few or no hospital facilities the movement increases markedly with increase in the average income of the population.

2. Over one-half of the intercounty movements involve a minimum distance of 12.4 miles or less. These movements appear to follow established trade routes but within smaller areas.

3. About 18 percent of the counties are centers of medical services for 66 percent of the counties. There remain 16 percent of the counties which are neither centers nor dependent counties. Of these approximately one-half belong to the lowest income group and have few or no hospital facilities.

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SECOND REPORT ON THE CONTROL OF *ANOPHELES QUADRIMACULATUS* SAY IN THE WATER-CHESTNUT AREAS OF THE POTOMAC RIVER, 1944 [1]

By MILTON M. PRICE, *Passed Assistant Engineer (R)*, and F. EARLE LYMAN, *Passed Assistant Sanitarian (R), United States Public Health Service*

During 1943 the Office of Malaria Control in War Areas of the United States Public Health Service, in cooperation with the health departments of Maryland, Virginia, and the District of Columbia, successfully controlled *Anopheles quadrimaculatus* Say in the vicinity of six military establishments along the Potomac River by airplane dusting the adjacent mosquito breeding areas (*1*). Similar control

[1] From the Office of Malaria Control in War Areas, States Relations Division. The authors wish to acknowledge the advice and assistance of Senior Sanitary Engineer (R) John M. Henderson, Senior Entomologist (R) George H. Bradley, and Passed Assistant Sanitarian (R) Herbert Knutson, U. S. Public Health Service. Acknowledgment is also made for the fullest cooperation received at all times from post commanders, and from medical and sanitary officers of the Army, Navy, and U. S. Public Health Service District 2, and health department officials of Maryland, Virginia, and the District of Columbia. The authors wish to express special appreciation to Lt. Col. Owen Ross, operations officer, at Turner Field, Marine Corps Air Station, Quantico, Va., for numerous courtesies extended.

measures were undertaken during 1944. However, the amount of airplane dusting necessary in 1944 was greatly reduced as a result of the water-chestnut cutting program of the United States Engineer Department, funds for which were furnished, in part, by the Office of Malaria Control in War Areas. This cutting program was begun by the United States Engineers in 1940 and has clearly demonstrated that water chestnut can be eliminated from the Potomac River by cutting the plants sufficiently early in the year to prevent reseeding for growth the following year.

A number of the military personnel stationed at Fort Belvoir and the Quantico Marine Barracks in 1944 had returned to the United States from highly malarious theaters of war, and since some were carriers of malaria the possibilities of transmission were greater during 1944 than in 1943. Recognition of this increased potential hazard was evident in the expressed concern of the authorities at both military posts and by the high priority given the dusting program on their schedules.

The operational aspects of the 1944 program were under the direction of the senior author while the entomological phases were under the direction of the junior author.

OPERATIONS

In general, the operational procedures for airplane dusting of the water chestnut in 1944 were similar to those followed in 1943 (*1*). On May 22 the United States Engineers began extensive cutting of the water chestnut, using 12 Hockney-type underwater cutters and 3 weed-saw cutters. This equipment was supplemented by 5 other Hockney-type cutters, 3 of which were used by the Naval Powder Factory at Indian Head, Md., and 2 by the Army at Fort Belvoir, Va. This total of 20 cutters was twice the number used in 1943.

At the start of airplane dusting operations in 1944, 620 acres of water chestnut were treated as compared with 3,759 acres in 1943, a reduction of approximately 85 percent. This reduction was due to cutting (fig. 1) which eliminated the need for dusting at all posts covered during 1943 with the exception of Fort Belvoir and the Quantico Marine Barracks, Va. The maximum acreage of water chestnut and swamps dusted was as follows:

	Acres *Chestnut*	Acres *Swamp*
Fort Belvoir:		
Pohick Bay	125	----
Accotink Bay		70
Quantico Marine Barracks:		
Quantico Creek	465	----
Chopawamsic Island	30	45
Chopawamsic Creek		255
	620	370

The planes used for the work by a commercial dusting company in 1944 were Piper Cruiser monoplanes. In these planes the plywood hopper, having a capacity of about 400 pounds of dust, was located behind the pilot. The mechanical arrangements for distribution of the dust were essentially the same as on the Stearman biplanes used in 1943 (*1*). Turner Field at the Marine Corps Air Station, Quantico, Va., again was used as a base for dusting operations.

The efficiency of the season's operations was greatly increased by the fact that during the previous winter months a large quantity of paris green dust mixture was prepared. Each batch was mixed in the proportion of 60 pounds of paris green to 200 pounds of soapstone (23 percent paris green) and bagged in 70-pound lots ready for use.

A summary of the season's operations, showing the total acreage dusted, amounts of paris green and soapstone applied, dusting time, and rates of application, is given in table 1. Dusting was done at 7-day intervals for 12 weeks between July 7 and September 22. The area dusted varied from a maximum of 990 acres on July 14 to a minimum of 440 acres on September 22. The total acreage dusted, including swamp areas, was 7,610 acres. This required a total of 8,791 pounds of paris green and a total flying time of 62 hours and 32 minutes. The average application per acre per treatment for the season was 4.62 pounds of larvicidal mixture containing 1.16 pounds of paris green. The average cost per acre per application was $1.35 compared to only $1.20 in 1943. The increased unit cost during 1944 is attributable to the smaller acreage dusted, which entailed an increase unit cost in overhead expense.

TABLE 1.—*Summary of dusting operations of water-chestnut areas, Potomac River, 1944*

Area	Acreage	Paris green		Diluent soapstone (pounds)	Dusting time	
		Pounds	Pounds per acre		Hours	Minutes
Fort Belvoir	1,560	2,295	1.50	6,875	27	16
Quantico	6,050	6,496	1.07	19,474	35	16
Total	7,610	8,791	1.16	26,349	62	32

ENTOMOLOGICAL SERVICES

The entomological services on the program in 1944 were conducted essentially in the same manner as in 1943 (*1*). However, during 1944 inspection work was concentrated at Fort Belvoir and the Quantico Marine Barracks in Virginia, since only these two areas were dusted by airplane. All other zones were kept under surveillance and were

dusted from boats only when the need was indicated by a rise in either larval or adult densities. Most of the necessity for inspection on the

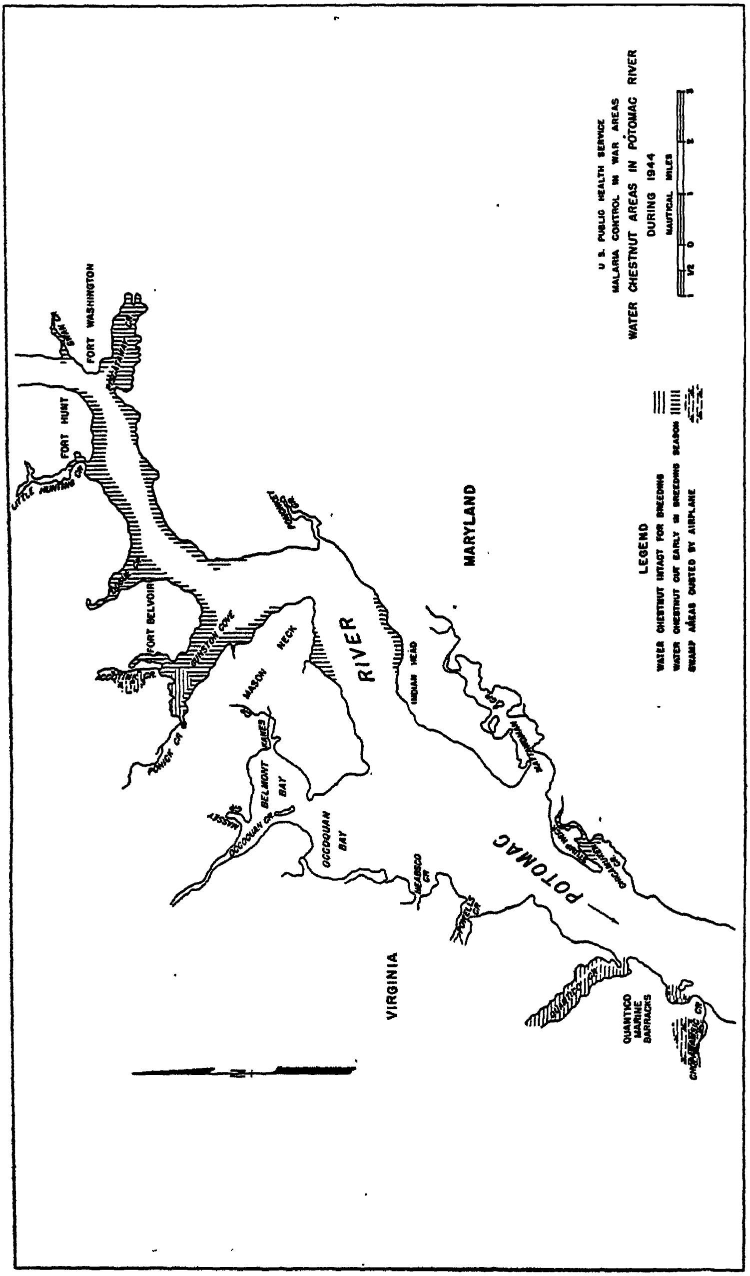


FIGURE 1

Maryland side of the river was eliminated by early cutting of the water chestnut.

Within the control zones virtually the same adult resting and larval stations were used to determine *A. quadrimaculatus* densities as in 1943. However, as cutting operations had eliminated the water chestnut outside the control limits early in the season, "check" stations could not be established.

During 1944 the first small rosettes of water chestnut were observed on the water surface on May 12 and by the end of May the plants were fairly large and numerous and covered most of Quantico Creek, Piscataway Creek, Gunston Cove, and Dogue Creek (fig. 1). The plants were in full bloom by June 12 and mature nuts were found early in July. The growth above Mount Vernon in the Fort Hunt area was much less dense in 1944 than in 1943 and demonstrated the effectiveness of early cutting. In Piscataway Creek where cutting was done in August 1943, after the seeds had matured, the density of the plants in 1944 was little reduced. Growth in Swan Creek, at Indian Head, and in Chicamuxen Creek was sparse.

TABLE 2.—*Approximate acreage and dates of cutting the water chestnut within the control areas adjacent to six military establishments on the Potomac River during 1944*

Area	Date cutting began	Date cutting completed	Approximate acreage cut
Stump Neck [1]		June 2	120
Fort Belvoir	May 22	June 13 [2]	1,300
Fort Washington	June 6	June 20	800
Indian Head [1]		June 26	30
Fort Hunt	June 23	June 29 [3]	200
Quantico	July 25	Aug. 10	500

[1] Cutting done by Naval Powder Factory personnel.
[2] Except for Pohick Bay.
[3] Except for upper portion of Little Hunting Creek.

The cutting of the water chestnut during 1944 reduced the entomological problem to a considerable extent. Cutting operations (table 2) began on May 22 in Dogue Creek at Fort Belvoir and were continued at various places along the river until the last plants were cut at Quantico Creek on August 10. While the cutting over of an area does not immediately eliminate it as a potential breeding site, it does reduce to a large degree the water-chestnut-breeding acreage. Once cut, the freed plants tend to aggregate into floating mats which shift their position with each change of wind direction and tide. Such rafts offer an excellent habitat for both *A. quadrimaculatus* and other mosquito larvae. Disintegration of the plants after cutting is slow and their eventual disappearance from a well-protected cove depends largely on the plants either being washed up on shore or swept out into the river. The cutting of the chestnut in Piscataway Creek (table 2) was practically completed by June 20, yet on July 22 some breeding still was present in scattered mats of flotage along the shore and in rafts drifting about in the open water.

Entomological records show that satisfactory control of *A. quadrimaculatus* was obtained during the entire season (table 4). The number of adult females recorded for any resting station observation remained below 10 throughout the summer, except for a single case on July 17, when the count reached 25 at Fort Washington. In those areas which were airplane dusted the number of adult females in a resting place on any given date remained below 5, with one exception. This occurred on August 21, when 6 specimens were found in a station at Fort Belvoir. In the adult resting stations males often outnumbered the females as was true in 1943. Only 60 adult females were taken throughout the entire summer from index stations within one-half mile of the protected areas. Brief notes on mosquito conditions at the several Army and Navy posts along the Potomac are contained in the following paragraphs.

Fort Belvoir.—In the vicinity of Fort Belvoir the chestnut was cut by the middle of June with the exception of about 125 acres in Pohick Bay. The swamp area above Accotink Bay and the chestnut in Pohick Bay were dusted weekly by plane from July 7 to September 22. All other water chestnut within the control area was dusted by boat. Inspections were begun on June 20 and continued until September 25. The larval records show a consistently low population of large larvae, the number being less than 1 per 100 dips on any day throughout the season. For any date the adult count did not reach 10 at any station within the control area. The monthly average light-trap collection per night (table 3) for 1944 indicates a lower *A. quadrimaculatus* population in 1944 than in 1943, except during the month of July. In both years, however, the density was exceedingly low.

TABLE 3.—*Light-trap catches of* Anopheles quadrimaculatus *per night per trap for 3 years at Fort Belvoir on the Potomac River*

	June		July		August		September	
	Males	Females	Males	Females	Males	Females	Males	Females
1942 [1]	------	------	------	------	4.40	69.40	0.50	20.40
1943 [1]	0	0.07	0	0.16	0	.31	0	.34
1944	0	.06	0	.21	0	.21	0	.17

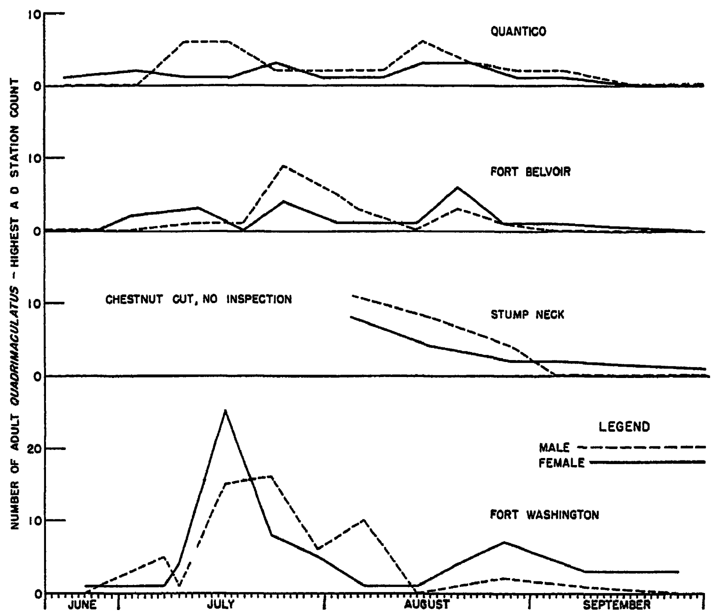
[1] From Murray and Knutson, 1944 (*1*).

Quantico.—The chestnut in Quantico Creek was not cut until late in the season and thus presented the principal control problem of the *Anopheles* breeding season. Cutting began late in July, at which time mature nuts were already abundant. Larval and adult populations were low throughout the summer and demonstrate the effectiveness of the airplane dusting operations. The largest number of adult females taken at any station on a single date was 3; however, the maximum male count reached 9 on one occasion, which indicates emergence nearby (fig. 2). In light-trap collections over the summer only 1 male and 1 female *A. quadrimaculatus* were taken. The number of large larvae per 100 dips per date was maintained below 1.

Fort Washington.—The first larvae from water-chestnut-covered areas (1 large and 1 small) were taken at Fort Washington 18 days earlier than in 1943. Breed-

ing was light, however, throughout the summer, the number of large larvae per date remaining well below 1 per 100 dips. The early cutting of the chestnut in Piscataway Creek reduced the acreage of breeding surface to such an extent that dusting by airplane was not necessary. On July 17 and 28 some breeding was occurring in floating mats of chestnut, but was controlled by dusting from boats In Swan Creek the chestnut was eliminated early in June before anopheline breeding commenced.

The highest number of *A. quadrimaculatus* females in any resting place along the Potomac River during the season occurred at Fort Washington on July 17. In this instance 25 specimens were taken under the porch of a cottage about three-



HIGHEST NUMBERS OF ADULT MALE AND FEMALE *ANOPHELES QUADRIMACULATUS* TAKEN IN RESTING STATIONS (A-D) ON VARIOUS DATES AT FOUR MILITARY ESTABLISHMENTS ALONG THE POTOMAC RIVER, 1944

FIGURE 2

fourths of a mile from the protected area. The following week only 10 were found and the number remained low for the rest of the summer (fig. 2). The two factors, dusting from boats and the eventual disappearance of the mats through wind and tidal action, were evidently effective in lowering the *A. quadrimaculatus* population.

Stump Neck.—All of the water chestnut at Stump Neck was cut by June 2 and thus there was no need for larval inspections during the early part of the season. As in 1943 (*1*) the water-chestnut plants did not all come to the surface in Chicamuxen Creek as early in the season as in other areas. Consequently early cutting did not accomplish the same degree of elimination as in other situations. Regrowth gradually occurred and by August 1 was sufficiently dense to provide good breeding conditions and dusting was done from boats. The

adult *A. quadrimaculatus* indices remained relatively low and reached a maximum of 8 females and 11 males at one station about a mile from the protected area on August 5.

The number of large larvae per 100 dips seems high when compared, for example, with the Fort Washington figures (table 4), where similar control measures were carried out. However, the actual amount of breeding surface was so much smaller at Stump Neck that the adult population index (fig. 2) remained low.

Indian Head.—The chestnut at Indian Head was cut early in June and no larvae were found during inspections made that month. The river here was completely free of chestnut plants by the end of June. A very few adult *A. quadrimaculatus* were taken at Indian Head but it is believed that these came from inland breeding areas.

Fort Hunt.—The early cutting of the chestnut at Fort Hunt in 1943 reduced the density of the growth in 1944. By the end of June 1944 this area was entirely recut except for a few acres upstream in Little Hunting Creek where the water was too shallow for efficient operation of the cutting machines. The uncut area was dusted by boat. Only one adult female was taken in the resting stations and only one by light trap during the summer in spite of the fact that larval inspections revealed relatively high counts during August. This condition may be explained by the fact that only a relatively small area of chestnut was involved in production.

DISCUSSION

Water-chestnut-cutting operations during 1944 greatly reduced the amount of *A. quadrimaculatus* breeding surface on the Potomac River, and consequently were an important factor in the over-all anopheline control. The remaining water-chestnut surfaces in which there was a sufficient breeding potential to justify control were dusted by airplane or boat. Evaluation of the effectiveness of the 1944 dusting operations is difficult since comparative locations outside of the dusted areas were not available. Thus, results for 1944 can only be expressed in terms of the low populations within the control zones. For all 6 military establishments (table 4) the mean number of large larvae per 100 dips was 0.52, while the average number of adult females per resting station per observation was 0.6. Indices to *A. quadrimaculatus* populations at Fort Washington, Fort Hunt, Indian Head, and Stump Neck are given in table 4. These data show that the number of adult females per resting station ranged from 0.1 to 0.5 which is a similar condition to that prevailing in 1943 when a full-scale dusting program was operated. Since only a relatively small amount of dusting was done in 1944, it may be concluded that the low anopheline populations were due chiefly to the cutting operations.

TABLE 4.—*Control of* Anopheles quadrimaculatus *at 6 military establishments along the Potomac River during 1944*

	Number of larvae per 100 dips		Number of adults per resting station	
	Small	Large [1]	Males	Females
Uncontrolled areas in 1943 [2]	46.60	40.53	73.1	63.9
Controlled areas in 1944:				
Fort Washington	.54	.14	1.4	2.0
Stump Neck	5.00	2.00	.4	.4
Indian Head	0	0	1.1	.5
Fort Belvoir	.58	.17	.3	.3
Fort Hunt	1.04	.79	0	.1
Quantico	.09	.04	.8	.5
Mean	1.21	.52	.7	.6

[1] Pupae included.
[2] From Murray and Knutson, 1944 (*1*). No uncontrolled areas available for observation in 1944.
[3] Probably inland breeding only.

Quantico was the only large area in which cutting was not a controlling factor until late in the season (August). Even here the cutting was finished sufficiently early to aid in the reduction of the anopheline population which normally reaches a seasonal high during August. The efficiency of the airplane dusting in this area seems to be clearly demonstrated (table 4), for the average number of adult females per resting station was 0.5. At Fort Belvoir excellent results are indicated. The 1944 light-trap data (table 3) show that the *A. quadrimaculatus* population remained as low as in 1943 and considerably below that of 1942. The 1,485 acres of water chestnut dusted in 1943 had been reduced by cutting operations to only 125 acres and no larvae were found in this area during 1944. At Fort Hunt where all but a few acres of chestnut were cut and at Stump Neck, where a regrowth occurred, the larval rates rose abruptly in August. However, the adult populations did not reflect the high larval counts because of the relatively small size of the areas involved.

SUMMARY AND CONCLUSIONS

This paper presents a discussion of the control of *A. quadrimaculatus* by airplane dusting with paris green and by the cutting of water chestnut in the Potomac River in 1944. The airplane dusting program was conducted by the Office of Malaria Control in War Areas of the United States Public Health Service in cooperation with the States of Virginia and Maryland, and the District of Columbia. Cutting operations to eradicate the water chestnut were continued by the United States Engineers and this cutting is considered to be the predominant factor in the control of *A. quadrimaculatus* adjacent to six military establishments located along the river during 1944.

Cutting operations had eliminated the necessity for airplane dusting in the vicinity of four of the six military establishments pro-

tected by this method in 1943. Dusting by airplane during 1944 was necessary only at Fort Belvoir and the Quantico Marine Barracks, Va., where breeding of *A. quadrimaculatus* in uncut chestnut areas and swamps occurred. Paris green was applied by airplane in these places at weekly intervals throughout the anopheline breeding season. A total of 7,610 acres was dusted in 1944, using 8,791 pounds of paris green, as compared with a total of 32,536 acres dusted with 40,277 pounds of paris green in 1943. The average cost of the work in 1944, including all expenditures for supervision, labor, and materials, was $1.35 per acre per application as compared with $1.20 in 1943. The greater cost in 1944 resulted from the increased overhead expenditure due to the smaller acreage dusted.

Entomological records show that *A. quadrimaculatus* production was successfully controlled throughout the 1944 breeding season.

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DEATHS DURING WEEK ENDED JULY 28, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended July 28, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,344	7,971
Average for 3 prior years	7,977	
Total deaths, first 30 weeks of year	276,164	279,883
Deaths under 1 year of age	623	573
Average for 3 prior years	623	
Deaths under 1 year of age, first 30 weeks of year	18,242	18,564
Data from industrial insurance companies:		
Policies in force	67,384,931	66,672,880
Number of death claims	12,304	12,833
Death claims per 1,000 policies in force, annual rate	9.5	10.1
Death claims per 1,000 policies, first 30 weeks of year, annual rate	10.7	10.3

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 4, 1945

Summary

The increase of 83 cases in the incidence of poliomyelitis during the current week is less than that for any of the past 3 weeks except last week (increase of 22). The increase for the corresponding week last year was 192. A total of 474 cases was reported currently, as compared with 391 last week, a 5-year median of 326, and 932 for the corresponding week last year.

Increases of more than 3 cases occurred in only 4 of the 13 States reporting more than 9 cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 15 (13), New York 83 (72), New Jersey 82 (32), Pennsylvania 31 (16), Illinois 26 (3), Oklahoma 14 (12), Utah 12 (11), Washington 12 (9); *decreases*—Ohio 12 (14), Virginia 15 (22), Tennessee 23 (29), Texas 38 (40), California 18 (21).

During the 4-week period ended with the current week, an aggregate of 1,488 cases was reported, an increase of 320 cases during this period, as compared with 2,702 and an increase of 644 for the corresponding period last year. The total to date this year is 2,913, as compared with 3,992 for the same period in 1944 and a 5-year median of 1,852.

Of the total of 118 cases of meningococcus meningitis reported, only 3 States reported more than 7 cases each—New York (17), Texas and California (10 each). The total to date is 5,999, as compared with 12,786 for the corresponding period last year and a 5-year median of 2,307.

Of 648 cases of bacillary dysentery, 510 were reported in Texas, and of 751 cases of unspecified dysentery, 634 were reported in Virginia (292 for the preceding week and 235 for the next earlier week).

A total of 8,152 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,346 last week, a 3-year (1942–44) average of 7,942, and 8,140 for the corresponding week last year. The total to date is 284,318, as compared with 288,023 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 4, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944	
NEW ENGLAND												
Maine	0	0	0	------	1	------	1	5	37	0	0	0
New Hampshire	0	0	0	------	------	------	0	4	3	1	0	0
Vermont	0	0	0	------	------	------	9	7	17	0	0	0
Massachusetts	3	3	2	------	------	------	95	87	114	3	12	8
Rhode Island	0	1	1	------	------	------	0	0	11	2	1	0
Connecticut	0	0	0	------	1	1	8	6	18	1	3	2
MIDDLE ATLANTIC												
New York	8	6	6	(1)	(1)	[1] 1	36	94	202	17	24	16
New Jersey	1	0	1	------	3	2	31	36	117	6	8	2
Pennsylvania	2	7	6	1	------	------	94	57	57	4	6	4
EAST NORTH CENTRAL												
Ohio	8	4	4	------	1	3	15	12	46	5	6	0
Indiana	8	8	4	6	------	2	7	5	10	0	4	1
Illinois	2	3	11	7	------	4	89	20	50	3	9	2
Michigan [2]	8	10	3	------	------	------	29	57	122	5	6	2
Wisconsin	5	0	1	6	5	5	43	101	188	5	3	1
WEST NORTH CENTRAL												
Minnesota	2	2	1	------	------	------	2	9	13	0	5	1
Iowa	0	3	3	------	------	------	8	13	20	1	0	1
Missouri	2	3	3	------	------	------	17	18	11	4	5	3
North Dakota	3	3	1	------	------	------	0	3	3	0	0	0
South Dakota	0	1	1	------	------	------	6	1	3	0	0	0
Nebraska	2	1	0	------	2	------	2	2	3	2	0	0
Kansas	8	1	2	------	------	1	9	13	15	3	2	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	1	0	1	0	0	0
Maryland [2]	7	3	3	------	1	1	2	4	31	2	4	4
District of Columbia	0	0	1	------	------	------	0	7	7	1	1	0
Virginia	4	10	7	30	35	35	7	10	43	2	8	2
West Virginia	12	0	2	20	------	------	0	13	9	1	5	1
North Carolina	18	5	9	------	1	------	2	16	16	2	5	1
South Carolina	8	7	3	57	94	94	10	17	19	1	2	2
Georgia	5	5	9	2	6	6	2	5	11	1	3	1
Florida	5	3	3	------	1	4	5	5	6	1	2	0
EAST SOUTH CENTRAL												
Kentucky	2	2	2	------	44	1	6	12	12	1	4	2
Tennessee	4	5	2	6	6	6	4	3	9	7	2	2
Alabama	7	7	8	31	8	8	0	1	10	2	5	1
Mississippi [2]	7	10	3	------	------	------	------	0	------	2	2	2
WEST SOUTH CENTRAL												
Arkansas	4	2	2	8	13	3	13	3	7	3	0	0
Louisiana	12	5	3	4	23	2	6	8	2	1	3	0
Oklahoma	2	4	2	12	6	6	3	3	4	4	0	0
Texas	47	31	19	360	166	166	52	120	70	10	10	1
MOUNTAIN												
Montana	1	2	1	5	3	------	2	2	17	0	0	0
Idaho	0	0	0	3	------	------	17	1	4	1	0	0
Wyoming	0	0	0	1	------	2	2	1	3	0	0	0
Colorado	4	9	7	9	1	7	4	12	13	0	1	0
New Mexico	6	3	0	1	------	------	3	1	4	0	0	0
Arizona	1	3	1	25	14	14	4	10	13	0	0	0
Utah [2]	0	0	0	------	------	------	78	21	21	0	1	0
Nevada	0	0	0	------	5	------	0	14	11	0	0	0
PACIFIC												
Washington	3	5	4	------	1	------	65	46	15	2	3	0
Oregon	4	2	2	1	------	------	15	18	18	2	1	1
California	28	11	10	5	4	20	234	335	151	10	21	6
Total	253	190	164	600	445	445	1,038	1,238	2,246	118	177	65
31 weeks	7,818	6,385	7,084	69,498	337,734	168,338	99,643	589,042	533,746	5,999	12,786	2,307

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended August 4, 1945, and comparison with corresponding week of 1944 and 5-year median

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44
	Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944		Aug. 4, 1945	Aug. 5, 1944	
NEW ENGLAND												
Maine	2	1	1	5	10	8	0	0	0	0	1	1
New Hampshire	1	1	0	1	2	1	0	0	0	0	0	0
Vermont	5	1	0	3	8	2	0	0	0	0	0	0
Massachusetts	15	23	1	40	54	53	0	0	0	1	8	4
Rhode Island	0	0	0	1	0	2	0	0	0	0	2	0
Connecticut	9	10	6	6	12	11	0	0	0	0	0	2
MIDDLE ATLANTIC												
New York	83	311	12	101	83	79	0	0	0	8	4	9
New Jersey	82	16	5	32	24	24	0	0	0	6	2	3
Pennsylvania	31	86	3	44	59	48	0	0	0	11	3	10
EAST NORTH CENTRAL												
Ohio	12	48	13	57	58	55	0	0	0	3	7	8
Indiana	5	36	5	18	19	9	0	0	0	1	6	1
Illinois	26	14	14	53	38	41	0	0	0	1	8	8
Michigan[2]	5	40	8	48	42	42	0	0	0	2	9	4
Wisconsin	3	5	1	30	62	37	0	0	0	1	0	1
WEST NORTH CENTRAL												
Minnesota	1	14	3	13	18	11	0	0	0	0	0	0
Iowa	5	1	1	13	16	16	0	0	0	0	1	1
Missouri	4	4	4	18	11	14	0	0	0	4	2	10
North Dakota	0	0	0	10	1	1	0	0	0	0	0	0
South Dakota	0	0	1	0	5	5	0	0	0	0	1	0
Nebraska	0	4	3	8	6	3	0	0	0	1	0	0
Kansas	5	5	5	15	11	10	0	0	0	0	4	5
SOUTH ATLANTIC												
Delaware	2	3	0	1	3	1	0	0	0	1	0	0
Maryland[2]	6	27	0	18	12	12	0	0	0	1	2	4
District of Columbia	3	9	0	7	4	4	0	0	0	0	0	0
Virginia	15	63	2	13	19	6	0	0	0	7	3	7
West Virginia	0	7	5	11	21	13	0	0	0	3	8	6
North Carolina	5	40	2	20	21	17	0	0	0	4	7	10
South Carolina	8	4	2	6	3	2	0	0	0	3	3	8
Georgia	5	7	1	5	9	10	0	0	0	10	8	13
Florida	1	7	1	2	2	2	0	0	0	1	1	2
EAST SOUTH CENTRAL												
Kentucky	0	65	8	16	10	12	0	0	0	20	8	13
Tennessee	23	4	4	17	14	14	0	0	0	11	6	7
Alabama	4	5	2	14	7	11	0	0	0	0	6	6
Mississippi[2]	1	10	2	7	1	3	0	0	0	3	13	13
WEST SOUTH CENTRAL												
Arkansas	2	0	1	2	2	3	1	0	0	1	5	8
Louisiana	4	21	5	18	5	5	0	0	0	21	6	9
Oklahoma	14	1	1	4	2	4	0	0	0	7	8	8
Texas	38	5	5	19	19	15	0	0	0	29	18	28
MOUNTAIN												
Montana	0	0	0	1	14	3	0	0	0	0	0	0
Idaho	0	0	0	5	1	1	0	1	0	4	1	0
Wyoming	0	0	0	1	2	2	0	0	0	0	0	0
Colorado	5	0	1	13	17	8	0	0	0	1	3	1
New Mexico	1	2	2	5	6	1	0	0	0	3	3	3
Arizona	0	1	1	1	2	2	0	0	0	0	0	1
Utah[2]	12	1	1	3	14	3	0	0	0	0	0	2
Nevada	0	0	0	0	0	0	0	0	0	0	1	0
PACIFIC												
Washington	12	5	5	11	22	22	0	0	0	2	2	2
Oregon	1	16	3	14	6	6	1	0	0	8	4	2
California	18	9	9	89	66	43	0	0	0	3	5	7
Total	474	932	326	839	843	705	2	1	2	182	179	233
31 weeks	2,913	3,992	1,852	133,004	146,231	96,206	261	288	604	2,481	2,926	3,595

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: New York 1; Ohio 1; Virginia 1; Georgia 3; Florida 1; Texas 2; California 1.

Telegraphic morbidity reports from State health officers for the week ended August 4, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Aug. 4, 1945	Whooping cough: Week ended— Aug. 5, 1944	Whooping cough: Median 1940–44	Week ended Aug. 4, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	75	15	19	0	0	0	0	0	0	0	0
New Hampshire	0	0	2	0	0	0	0	0	0	0	0
Vermont	28	25	25	0	0	0	0	0	0	0	1
Massachusetts	141	58	108	1	1	0	0	0	0	0	0
Rhode Island	4	2	15	0	0	0	0	0	0	0	0
Connecticut	13	45	46	0	1	0	0	0	0	0	3
MIDDLE ATLANTIC											
New York	356	160	249	5	7	0	3	0	0	0	7
New Jersey	237	79	99	1	0	0	0	3	0	0	2
Pennsylvania	233	91	229	0	1	0	1	0	0	0	1
EAST NORTH CENTRAL											
Ohio	280	166	260	0	1	0	0	0	0	0	1
Indiana	55	24	24	0	0	1	1	2	0	0	2
Illinois	118	109	181	2	40	0	1	3	2	0	11
Michigan [3]	74	99	257	0	3	0	0	0	0	0	4
Wisconsin	87	151	225	0	0	0	0	0	0	0	15
WEST NORTH CENTRAL											
Minnesota	10	15	53	0	0	4	0	0	0	0	6
Iowa	10	8	36	0	0	0	1	0	0	0	5
Missouri	23	19	36	0	0	0	0	0	2	0	0
North Dakota	0	3	11	0	0	0	0	0	0	0	0
South Dakota	1	22	6	0	0	0	0	0	0	0	2
Nebraska	0	9	7	0	0	0	1	0	0	0	1
Kansas	24	23	57	0	0	0	1	1	0	0	4
SOUTH ATLANTIC											
Delaware	1	1	2	0	0	0	0	1	0	0	0
Maryland [3]	54	112	112	0	0	2	0	3	0	[*]1	1
District of Columbia	16	0	20	0	0	0	0	1	0	0	0
Virginia	71	70	56	2	0	634	0	12	0	0	0
West Virginia	52	41	27	0	0	0	0	0	0	0	0
North Carolina	163	203	199	0	1	0	0	7	1	1	1
South Carolina	71	84	84	2	38	0	0	1	0	9	0
Georgia	21	20	20	0	6	0	0	1	0	21	3
Florida	11	5	8	0	0	0	0	0	1	11	0
EAST SOUTH CENTRAL											
Kentucky	54	106	71	0	0	0	0	2	0	0	2
Tennessee	73	28	44	0	0	13	0	4	0	0	1
Alabama	18	22	22	3	0	0	0	0	0	23	1
Mississippi [3]	------	------	--------	0	0	0	0	0	1	8	3
WEST SOUTH CENTRAL											
Arkansas	27	10	10	11	1	0	0	0	1	0	0
Louisiana	39	2	5	2	31	0	0	0	3	24	2
Oklahoma	16	3	7	3	2	0	0	2	0	0	1
Texas	161	178	178	12	510	76	0	0	1	73	10
MOUNTAIN											
Montana	2	35	29	0	1	0	0	0	1	0	0
Idaho	6	2	7	0	0	0	0	0	0	0	0
Wyoming	5	14	6	0	0	0	0	1	0	0	0
Colorado	49	21	30	0	0	0	0	1	0	0	1
New Mexico	6	3	12	0	0	1	0	0	0	0	2
Arizona	10	14	15	0	0	14	0	0	0	0	1
Utah [3]	33	63	63	0	0	0	0	1	0	0	2
Nevada	0	1	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	37	22	59	0	0	0	0	1	0	0	3
Oregon	19	12	19	0	0	6	0	0	0	0	1
California	216	75	185	3	4	0	5	0	0	2	3
Total	3,000	2,270	3,043	47	648	751	14	47	13	173	103
Same week, 1944	2,270	------	--------	46	644	321	19	39	12	222	102
Average, 1942–44	3,109	------	--------	39	490	368	18	[4]21	17	[4]115	------
31 weeks, 1945	79,405	------	--------	1,124	14,956	4,970	242	306	492	2,310	2,947
1944	58,834	------	--------	1,000	12,724	4,585	350	323	367	2,301	2,179
Average, 1942–44	100,210	------	[4]116,280	974	8,969	4,072	335	[4]323	515	[4]1,506	------

[*] Tsutsugamushi (scrub typhus). [3] Period ended earlier than Saturday. [4] 5-year, median 1940–44.

Leprosy: Louisiana, 2 cases.

WEEKLY REPORTS FROM CITIES

City reports for week ended July 28, 1945

This table lists the reports from 86 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	1	0	2	0	0	0
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	2	0	0	0
Massachusetts:												
Boston	2	0	------	0	21	4	8	8	8	0	0	40
Fall River	0	0	------	0	0	0	1	0	0	0	0	4
Springfield	0	0	------	0	1	0	0	0	3	0	0	5
Worcester	0	0	------	0	32	0	6	0	1	0	0	7
Rhode Island:												
Providence	0	2	------	0	0	1	3	0	0	0	0	0
Connecticut:												
Bridgeport	0	0	------	0	1	0	0	1	1	0	0	0
Hartford	0	0	------	0	2	0	2	0	1	0	0	1
New Haven	0	0	------	0	1	0	1	1	0	0	0	20
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	7	3	3	0	0	10
New York	4	2	2	0	27	8	25	25	19	0	4	165
Rochester	0	0	------	0	0	0	2	2	2	0	0	10
Syracuse	0	0	------	0	0	0	3	1	1	0	0	46
New Jersey:												
Camden	0	0	------	0	1	0	2	0	1	0	0	2
Newark	0	0	------	0	1	0	2	2	1	0	0	24
Trenton	0	0	------	0	0	0	0	9	0	0	0	2
Pennsylvania:												
Philadelphia	1	0	------	0	68	4	19	6	11	0	3	96
Pittsburgh	1	0	------	0	3	1	4	2	2	0	0	23
Reading	0	0	------	0	0	0	1	0	0	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	4	2	3	1	4	0	0	21
Cleveland	0	0	1	0	0	3	4	3	6	0	0	59
Columbus	1	0	------	0	0	0	2	0	3	0	0	10
Indiana:												
Fort Wayne	0	0	------	0	0	0	2	0	1	0	0	0
Indianapolis	0	0	------	0	4	1	6	0	3	0	0	9
South Bend	1	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	0	1
Illinois:												
Chicago	2	0	------	0	87	7	24	3	15	0	0	89
Springfield	0	0	------	0	0	0	2	0	4	0	0	0
Michigan:												
Detroit	8	0	------	0	40	0	6	6	7	0	0	56
Flint	0	0	------	0	3	0	2	0	5	0	0	0
Grand Rapids	0	0	------	0	1	0	0	0	1	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	0
Milwaukee	0	0	------	0	15	2	0	0	8	0	1	1
Racine	0	0	------	0	1	0	0	0	2	0	0	1
Superior	0	0	------	0	1	0	0	0	0	0	0	6
WEST NORTH CENTRAL												
Minnesota:												
Duluth	2	0	------	0	1	0	2	0	2	0	0	2
Minneapolis	2	0	------	0	1	1	4	0	9	0	0	2
St. Paul	0	0	------	0	2	1	1	0	1	0	0	6
Missouri:												
Kansas City	0	0	------	0	8	0	4	0	1	0	1	1
St. Joseph	0	0	------	0	1	0	0	0	2	0	0	0
St. Louis	0	0	------	0	7	3	16	1	5	0	3	38

City reports for week ended July 28, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	0	1	3	0	3	0	0	3
Kansas:												
Topeka	0	0	------	0	0	0	0	0	3	0	0	2
Wichita	0	1	------	0	1	0	1	2	2	0	0	6
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	1	0	0	0	0	7
Maryland:												
Baltimore	9	0	------	0	2	0	3	0	4	0	0	57
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	1	0	2	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	1	9	5	5	0	1	10
Virginia:												
Lynchburg	0	0	------	0	1	0	0	0	0	0	0	0
Richmond	0	0	------	0	0	1	1	25	0	0	0	22
Roanoke	1	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	1	0	0	0	1	0	0	1
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	1	0	0	1
Wilmington	0	0	------	0	0	0	1	0	2	0	0	8
Winston-Salem	0	0	------	0	1	0	0	0	2	0	0	22
South Carolina:												
Charleston	1	0	1	0	0	0	0	1	2	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	2	0	0	0	0	2
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
Savannah	0	0	1	1	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	2	1	7	0	0	0	0	13
Nashville	0	0	------	0	0	0	4	2	0	0	0	4
Alabama:												
Birmingham	0	0	------	0	0	0	2	7	0	0	0	1
Mobile	2	0	------	0	0	1	0	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	1	0	0	0
Louisiana:												
New Orleans	3	0	1	0	2	4	4	4	3	0	1	1
Shreveport	0	0	------	0	0	0	0	4	0	0	1	0
Texas:												
Dallas	0	0	------	0	2	0	5	2	3	0	0	7
Galveston	0	0	------	0	0	0	2	0	0	0	0	2
Houston	2	0	------	0	1	0	3	7	3	0	2	0
San Antonio	2	0	------	0	0	0	2	0	0	0	0	2
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	0	0	1	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	1	0	0	0
Missoula	0	0	------	0	0	0	1	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	3	0	2	0	3	0	7	1	7	0	0	23
Pueblo	1	0	------	0	1	0	0	0	0	0	0	0
Utah:												
Salt Lake City	0	0	------	0	19	0	4	4	2	0	6	11

City reports for week ended July 28, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	2	0		1	26	1	2	0	4	0	1	7
Spokane	0	0	1	1	2	0	1	0	2	0	0	6
Tacoma	1	0		0	17	0	0	0	0	0	0	3
California:												
Los Angeles	0	0	1	0	16	1	1	1	26	0	0	41
Sacramento	2	0		0	7	0	2	0	2	0	0	1
San Francisco	1	0		0	65	1	4	2	7	0	0	3
Total	55	5	10	3	504	51	240	143	224	0	19	1,026
Corresponding week, 1944	43		14	3	379		195		231	0	17	621
Average, 1940–44	39		25	[1] 6	[2] 753		[1] 237		231	0	34	1,111

[1] 3-year average.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York, 2; Spokane, 1; Los Angeles, 2.
Dysentery, bacillary.—Cases: New York, 4; Cleveland, 1; Detroit, 3.
Dysentery, unspecified.—Cases: Richmond, 2; San Antonio, 8.
Leprosy.—Cases: New Orleans, 1.
Rocky Mountain spotted fever.—Cases: Richmond, 1.
Tularemia.—Cases: St. Louis, 1.
Typhus fever, endemic.—Cases: New York, 1; Raleigh, 1; Charleston, S. C., 1; Atlanta, 2; Brunswick, 1; Birmingham, 2; Mobile, 2, New Orleans, 1; Shreveport, 1; Houston, 2; San Antonio, 2; Savannah, 3.

Rates (annual basis) per 100,000 population, by geographic groups, for the 86 cities in the preceding table (estimated population, 1943, 34,162,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	5.3	5.3	0.0	0.0	155	13.1	57.8	26.3	47	0.0	0.0	202
Middle Atlantic	2.8	0.9	0.9	0.0	46	6.0	30.1	23.1	19	0.0	3.2	176
East North Central	7.3	0.0	0.6	0.0	95	9.1	31.0	7.9	36	0.0	0.6	154
West North Central	10.1	2.0	0.0	0.0	42	12.1	62.3	6.0	56	0.0	8.0	121
South Atlantic	19.1	0.0	3.5	1.7	9	5.2	33.1	57.4	30	0.0	1.7	226
East South Central	11.8	0.0	0.0	0.0	12	11.8	76.7	53.1	6	0.0	0.0	106
West South Central	20.1	0.0	2.9	0.0	14	11.5	48.8	48.8	29	0.0	11.5	34
Mountain	31.8	0.0	15.9	0.0	183	0.0	95.3	39.7	79	0.0	7.9	270
Pacific	9.5	0.0	3.2	3.2	210	4.7	15.8	4.7	65	0.0	1.6	96
Total	8.4	0.8	1.5	0.5	77	7.8	36.7	21.9	34	0.0	2.9	157

PLAGUE INFECTION IN SAN BENITO COUNTY, CALIF.

Under date of July 18, 1945, plague infection was reported proved on July 13 in 5 specimens of tissue and fleas from ground squirrels, *C. beecheyi*, shot in San Benito County, Calif., at locations east and southeast of Tres Pinos, as follows: In a pool of 750 fleas from 27 ground squirrels and in tissue from 5 ground squirrels, 7 miles east and 5 miles south; in a pool of 1,650 fleas from 41 ground squirrels (under date of July 30, proved July 25, in a pool of 150 fleas from the same 41 ground squirrels) and in tissue from 5 ground squirrels,

8 miles east and 5 miles south; in a pool of 150 fleas from 47 ground squirrels, 7 miles east of Tres Pinos. Under date of July 25, plague infection was reported proved on July 17 in tissue from 5 ground squirrels, *C. beecheyi*, shot at the latter location, and in a pool of 150 fleas from 35 ground squirrels, same species, shot in the same location.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Honolulu—Influenza.[1]—For the period June 3 to July 14, 1945, 4,113 cases of influenza were reported in Honolulu, Hawaii Territory.

Panama Canal Zone

Notifiable diseases—June 1945.—During the month of June 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	6		1		3		1		11	
Diphtheria	3						2		5	
Dysentery:										
Amebic	1						5		6	
Bacillary	1		1						2	
Malaria [1]	8		9		76		65	2	158	2
Measles			2		1				3	
Meningitis, meningococcus	1						1		2	
Mumps			1		4				5	
Paratyphoid fever	1		1						2	
Pneumonia		12		7	42			5	[2] 42	24
Tuberculosis		11		9	5	2		5	[2] 5	27
Typhoid fever			2				1		3	
Typhus fever							2		2	
Whooping cough					3				[2] 3	

[1] 30 recurrent cases.
[2] Reported in the Canal Zone only.

Puerto Rico

Notifiable diseases—4 weeks ended July 14, 1945.—During the 4 weeks ended July 14, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	2	Poliomyelitis	1
Chickenpox	53	Puerperal fever	3
Diphtheria	43	Syphilis	252
Dysentery, unspecified	7	Tetanus	11
Filariasis	2	Tetanus, infantile	1
Gonorrhea	219	Tuberculosis (all forms)	455
Influenza	33	Typhoid and paratyphoid fever	38
Leprosy	1	Typhus fever (murine)	39
Malaria	289	Undulant fever	1
Measles	145	Whooping cough	107
Ophthalmia neonatorum	2		

[1] See also page 817 of the PUBLIC HEALTH REPORTS of July 13, 1945.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 14, 1945.—During the week ended July 14, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		56	12	38	172	24	8	55	69	434
Diphtheria		6	2	41	6	4	1			60
Dysentery, bacillary									9	9
German measles		44		11	25		3	13	4	100
Influenza		22			30	1			3	56
Measles		4	1	30	58	8	13	21	50	185
Meningitis, meningococcus				2	2					4
Mumps				46	52	14	17	37	10	176
Poliomyelitis					3					3
Scarlet fever		4	6	24	52	8	3	17	10	124
Tuberculosis (all forms)		1	1	91	31	22	33	25	36	240
Typhoid and paratyphoid fever		9	1	9	1			2	1	23
Undulant fever					13					13
Venereal diseases:										
Gonorrhea		17	33	64	181	48	33	34	78	488
Syphilis		10	12	105	77	10	10	11	34	269
Whooping cough		16	3	124	18	1	2	10	6	180

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Canada—Alberta Province.—Under date of July 23, 1945, plague infection was reported in 5 pools of fleas collected from squirrels near Cereal, and in a pool of fleas collected south of Hanna, Alberta Province, Canada.

Egypt.—For the week ended June 30, 1945, 16 cases of plague with 4 deaths were reported in Egypt. For the week ended July 21, 1945, 5 cases of plague were reported in Ismailiya, Egypt.

Great Britain—Malta.—For the week ended July 21, 1945, 4 cases of plague, including 2 suspected cases, with 3 deaths were reported in Malta, Great Britain.

Morocco (French).—For the period July 11–20, 1945, 63 cases of plague were reported in French Morocco. On July 25, 1945, 1 case of plague was reported in Casablanca, French Morocco.

Smallpox

Morocco (French).—For the period July 11–20, 1945, 147 cases of smallpox were reported in French Morocco.

Nigeria.—For the week ended June 2, 1945, 114 cases of smallpox with 23 deaths were reported in Nigeria, including 2 cases of smallpox with 5 deaths reported in Lagos.

Sudan (French).—Smallpox has been reported in French Sudan as follows: July 1–10, 1945, 166 cases; July 11–20, 1945, 29 cases.

Typhus Fever

Chile.—For the period May 20 to June 16, 1945, 38 cases of typhus fever with 2 deaths were reported in Chile, including 5 cases in Antofagasta, 8 cases in Iquique, 5 cases with 1 death in Santiago, 3 cases in Talcahuano, and 6 cases in Valparaiso.

Egypt.—For the week ended June 30, 1945, 314 cases of typhus fever with 41 deaths were reported in all of Egypt. For the week ended May 26, 1945, 10 fatal cases of typhus fever were reported in Alexandria, 87 cases with 17 deaths were reported in Cairo, 1 case in Damietta, 6 cases in Ismailiya, 6 cases in Port Said, and 2 cases with 1 death were reported in Suez, Egypt.

Morocco (French).—For the period July 11–20, 1945, 693 cases of typhus fever were reported in French Morocco, including 26 cases reported in Casablanca, and 1 case in Rabat.

Yellow Fever

Venezuela.—Information dated July 3, 1945, stated that cases of yellow fever had been reported in the villages of Morotuto, La Tiendida, San Simon, and Hernandez in the District of Jauregui, Tachira State, Venezuela. During the month of June more than 35 deaths occurred. Information dated July 27, 1945, reports 2 cases of yellow fever at Machiques, Zulia State, about 150 miles south of Maracaibo, Venezuela.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

VOLUME 60 AUGUST 31, 1945 NUMBER 35

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Public Health Reports

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DDT WATER EMULSION IN RICE FIELDS AS A METHOD OF CONTROLLING LARVAE OF *ANOPHELES QUADRIMACULATUS* AND OTHER MOSQUITOES [1]

By FREDERICK L. KNOWLES, *Senior Biophysicist*, and FRANK W. FISK, *Sanitarian (R), United States Public Health Service*

The control of anopheline mosquito breeding in rice fields is a perplexing problem to the malariologist. The extensive areas employed and the necessity of keeping the rice fields continually flooded assure an excellent habitat for anopheline larvae during most of the summer. Also, because of the extensiveness of the areas and the susceptibility of growing rice to injury, ordinary methods of larviciding are limited and expensive.

William R. Horsfall (*1*), using experimental field plots, found that a water-miscible oil in dosages as low as 4 p. p. m. gave complete control of the dark rice-field mosquito, *Psorophora confinnis* (L.-A.), but he stated that a method of practical application of this means of control on a large scale had not been worked out. Because of the extreme toxicity of 2,2 bis(p-chlorophenyl)-1,1,1 trichloroethane (DDT) to mosquito larvae, DDT being much more toxic than the water-miscible oil used by Horsfall, it was believed that this larvicide could be adapted to the successful control of mosquito breeding in rice fields.

Rice culture in the Stuttgart area of Arkansas, where this study was made, utilizes water pumped from deep wells or reservoirs and

[1] From Office of Malaria Investigations, National Institute of Health, Memphis, Tenn. This paper was approved for publication February 28, 1945, and scheduled for publication in PUBLIC HEALTH REPORTS in the issue of April 6, 1945. Because of the subject matter the paper was withheld from publication at that time.

Assisting in this study were Senior Sanitary Engineer H. A. Johnson and Scientific Assistant John R. Jumper of the Office of Malaria Investigations of the National Institute of Health; Assistant Engineer (R) K. S. Krause, Associate Sanitarian J. H. Crawford, and Assistant Sanitarian (R) R. D. Murrill, all of the Office of Malaria Control in War Areas, U. S. Public Health Service.

The University of Arkansas Agricultural Experiment Station, through Dr. J. W. White, Assistant Director in Charge of the Rice Branch Station at Stuttgart, furnished for this study fields of growing rice, as well as laboratory and office space. Mr. Dwight Isely, Professor of Entomology at the University of Arkansas, served as a consultant.

routed to the rice fields through canals (fig. 1). Because the greatest part of the cost of ordinary larviciding is for labor utilized in obtaining proper distribution of the larvicide, any attempt to render rice-field larviciding inexpensive must materially reduce the cost of labor. The use of a DDT water-miscible larvicide introduced into the flooding waters at the pump, a process somewhat similar mechanically to chlorination, would eliminate the labor costs and should obtain proper distribution of the larvicide. Laboratory tests have demonstrated that 1 part DDT in 100,000,000 parts water is toxic to mosquito larvae and that water so treated would remain toxic for long periods of time, so that, theoretically, DDT added to the flooding waters at the pump at the rate of 1 part per 10,000,000 parts of water should be sufficient to kill larvae even though there were variations in the dosages when the flooding waters reached the farthest corners of the rice fields.

The University of Arkansas maintains a Rice Experiment Station near Stuttgart, Ark., and has been interested in controlling mosquito breeding in the rice fields (*1*). Also, the office of Malaria Control in War Areas of the United States Public Health Service was interested in the same problem because at Stuttgart itself there was an Army Air Field surrounded by acres of rice fields. Because of these similar interests, both of the above organizations have cooperated in this study.

The 100-acre field of rice, which was made available by the Rice Branch Station for use in this study, was divided into six plots of 12 to 18 acres in size (fig. 3), and was located along the west edge of the grounds of the Experiment Station. Each plot was roughly square in shape, and together they comprised a field a mile long and about 700 feet in width. These field plots were separated from each other by cross levees, permitting individual irrigation. Each plot was planted to a different variety of rice, registered seed being grown. The rice was planted early in May. About a month later, when the stalks were 6 to 8 inches tall, flooding began and continued about 20 days. As a method of controlling the rice water weevil, *Lissorhoptrus simplex* (Say), the fields are allowed to dry and in about 2 weeks the second flooding is started, and the fields then remain flooded until the rice has headed out and the heads turned over. For the short-season varieties this occurred in mid-August, while the slower-growing varieties were not drained until early September. The rice was harvested as soon as the field had dried.

Besides the 100-acre rice field, 30 small plots, one-twentieth of an acre in size, and adjacent to each other, were made available by the Rice Branch Station for additional studies of the effects of a DDT-emulsion larvicide. The same method of rice culture was carried out in these small plots as in the 100-acre field.

FIGURE 1.—Pump station where water was pumped into canals and larvicide applied.

FIGURE 2.—Inspectors making larval counts in rice field. The stakes denote sampling stations.

MATERIALS, METHODS, AND PROCEDURE

The DDT water-miscible larvicide was prepared according to the following formula:

DDT	1 part
Solvent [2]	3 parts
Triton X-100	1 part

Depending on the rate of operation of the dispensing apparatus and the desired rate of application to the rice fields, the stock solution was diluted with water to the desired concentration.

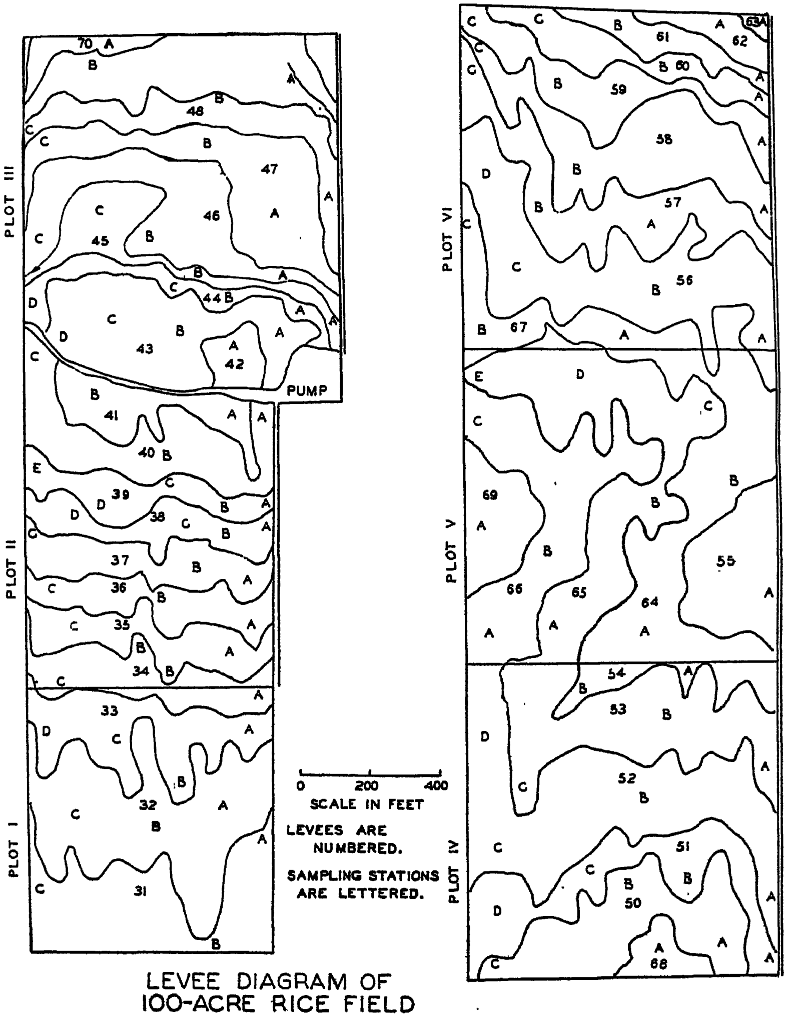

FIGURE 3.—Diagram of 100-acre rice field showing levees and sampling stations. For illustration purposes two fields are shown; actually, there was one long field, plot IV being adjacent to plot III.

[2] The solvents employed were xylene; Culicide Oil B, which was furnished by the Socony Vacuum Oil Co.; Dendrol, which is a product of Standard Oil Co. of Indiana; and a mixture of xylene and Culicide Oil B. Trition X-100, the emulsifier, is made by the Rohm & Haas Co.

The first dispensing arrangement consisted of a 5-gallon glass bottle containing the larvicide, inverted in a flat pan about 14 inches in diameter and about 2 inches deep. From this pan the larvicide was siphoned to a similar pan, and from the second pan siphoned into the water coming from the pump, the flow from both siphon tubes being regulated by raising or lowering the outlet. Evaporation from the pans and clogging of the siphon tubes demanded constant attention on the part of the operator in order to assure that the desired amount of DDT was released into the flooding water.

The arrangement finally used employed a pump (fig. 4) ordinarily used for chlorination, which pumped water into a airtight bottle, the

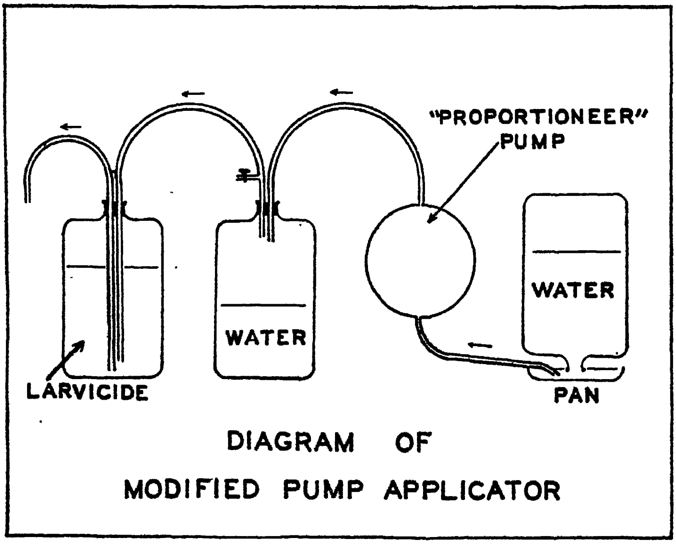

FIGURE 4.—Diagrammatic sketch of apparatus used for dispensing larvicide at a predetermined rate in flooding water at the pump.

displaced air being forced into another airtight bottle containing the larvicide, and equilibrium in the larvicide bottle being maintained by displacing the larvicide through an outlet tubing. The pump was belt-driven by a pulley attached to the well pump and was adjusted to deliver a constant amount of water. This water displaced an equal amount of air, which in turn displaced a constant amount of larvicide into the flooding water. This modification, instead of using the pump directly, was necessary because of the deleterious action of the solvents used on the pump. The applicator pump was adjusted to deliver 25 ml. per minute. This rate was checked and recorded every half hour at the delivery outlet by means of a 100-ml. graduated cylinder and a stop watch.

To determine the prevalence of mosquito larvae in the rice field, a routine sampling method was employed. Sampling stations were

designated in each of the levees contained in the six plots comprising the 100-acre field. The levees were numbered and the sampling stations indicated by A, B, C, etc., the A stations being nearest the water entrance of each levee, as shown in figure 3.

Sampling at each station consisted of enumerating the number of larvae in approximately 15 dips; that is, 15 negative dips were considered sufficient; if larvae were present but very scarce 20 dips were taken to get a better idea as to abundance; if larvae were very numerous 10 dips were sufficient, but this was the minimum. During the beginning of the season and following the second flooding, the larvae most commonly taken were *P. confinnis* (L.-A.) and *P. discolor* (Coq.), the rice field mosquitoes, since these larvae hatch very soon after flooding from eggs which have been laid in the drying fields. Following the suggestion of W. R. Horsfall (*1*), it was found that *Psorophora* larvae could most easily be captured by a rapid dipping or skimming with a stout-handled fine-mesh sieve. Later in the season when *Anopheles quadrimaculatus* Say larvae were most abundant and the rice taller, the conventional enamel dipper was used. Larvae of *Culex erraticus* D. & K. were also present at this time. Sampled larvae which were easily recognized as *Anopheles* or *P. confinnis* were counted and discarded; but questionable larvae were placed in small vials and later checked in the laboratory.

Because of the differing life cycles of the *Anopheles* and rice field mosquitoes, the first sampling was made on the day flooding was completed, the second 2 days later, the third 4 days later, the fourth 7 or 8 days later, followed by weekly samplings (fig. 2).

In order to obtain an indication of the normal prevalence of mosquito larvae in an untreated rice field, larval counts were made by 4 inspectors sampling at 4 different locations, and averaging 25 dips per station, in an untreated rice field adjacent to plots I and II, which were also inspected in the same manner for comparison.

DDT was applied to the 30 small, 1/20-acre plots in concentrations of 100, 10, 1, 0.2, and 0.1 p.p.m. in an emulsion employing either xylol, Culicide B oil, Dendrol, or a combination of xylol and Culicide B oil as solvents for the DDT. Two larval sampling stations were located in every plot, one at each end of the plot, and weekly inspections for larvae were made at each station.

Drying the rice fields between the first and second flooding is a method of reducing the number of root-infesting larvae of the rice water weevil (*2*). Water treated with DDT might provide another method of controlling the rice water weevil. Since the DDT-treated water does come into contact with these insects, both as adults and as larvae, samples of rice roots were examined in treated and untreated fields to determine the number of larvae present and evaluate, if possible, the effects of DDT on the larvae.

Samples were taken by means of a 4-inch-wide post-hole digger so that the muddy soil surrounding the rice roots would be included. Two samples were taken in each of the 30 small plots. Because of the generally light infestation, samples were not taken at random, but an attempt was made to locate the more heavily infested "stools." Plants which appeared to be stunted, yellowish, and with characteristic feeding scars caused by the adult beetles were preferred. It was noted that isolated stalks or clumps of stalks suffered the highest infestations so that these were selected when possible. Hence the number of stalks included in each sample varied from 1 to 2 and part of a third, but the size of the soil sample was constant.

Each sample was placed in a 5-gallon jar of water. The roots were rinsed free of mud and inspected. Generally the weevil larvae did not remain on the roots but were washed off with the mud and could be discovered when the muddy rinsings were poured through an 18-mesh sieve. This sieve would not hold first instar larvae, but, according to

TABLE 1.—*Number of anopheline larvae per 10 dips for 6 plots for various treatments at different distances from water entrance*

Plot No.	Treatment		Flood period	Distance in feet from water entrance							
	Solvent	DDT (p. p. m.)		0–200	200–400	400–600	600–800	800–1,000	1,000–1,200	1,200–1,400	1,400–1,600
				Number of larvae per 10 dips							
I	X	0.1	1st	1.2	1.4	0.9	0.8	----	----	1.4	----
	X	0.1	2nd	0	0	2.4	2.9	----	----	4.6	----
Aver.[1]	----	----	----	0.4	0.4	1.9	2.2	----	----	3.5	----
II	X	0.05	1st	0	0.1	0.3	0.6	6.6	3.8	11.9	0
	B	0.2	2nd	0	0	0.5	0.6	2.1	1.9	2.3	1.4
Aver.[1]	----	----	----	0	0	0.4	1.0	3.4	3.4	5.4	1.2
III	X	0.2	1st	0.2	0	0.4	6.0	0	0	0	0
	D	0.2	2nd	0.3	0.5	1.1	1.2	0.6	0.9	1.0	2.1
	BX	0.2	2nd	0	0	0	1.5	0.3	0	0.7	0.2
Aver.[1]	----	----	----	0.2	0.2	0.4	2.3	0.4	0.3	1.1	0.8
IV	X	0.05	1st	0.8	----	4.0	2.8	2.6	1.8	0	----
	B	0.1	2nd	0.3	----	1.9	2.9	7.2	3.9	2.7	----
Aver.[1]	----	----	----	0.4	----	2.3	2.9	6.2	3.1	3.3	----
V	X	0.2	1st	0.6	0.1	1.0	0.4	0.4	0.5	1.5	----
	X	0.2	2nd	1.8	2.1	2.5	4.4	4.2	4.2	5.3	----
Aver.[1]	----	----	----	1.3	1.2	1.9	2.8	2.5	2.7	3.8	----
VI	X	0.1	1st	0.5	0	0.5	0.8	0.6	2.4	1.9	1.2
	D	0.1	2nd	0	0	0.2	0.8	0.6	0.7	0.1	0.3
	BX	0.1	2nd	1.4	2.6	2.6	4.4	4.4	8.8	8.4	7.2
Aver.[1]	----	----	----	0.7	0.9	1.4	2.0	2.2	4.6	3.4	3.2

[1] Averages weighted according to the number of samples per flood period.

Solvent legend:

X=Xylol
B=Culicide Oil B
BX=Culicide Oil B-xylol mixture
D=Dendrol

Isely and Schwardt (*2*), stools taken so late in the season should have but 5 percent of the infestation as first instar larvae, while 50 percent should be third instar (mature) larvae. Most of the larvae actually taken were nearly full grown. Two pupae were noted.

RESULTS AND DISCUSSION

The distance from the point of entrance of the water into each plot to each of the sampling stations within the plot was determined from the diagram in figure 3, by measuring the approximate path the water followed from its entrance, along the levee, to the station. Inspection stations were then grouped into intervals of 200 feet, measured from the plot water entrance. The average numbers of larvae per 10 dips (calculated from approximately 28,000 dips) for these 200-foot intervals for each of the 6 plots, and for the treatments and flooding periods indicated are summarized in tables 1 and 2. Table 1 gives the data for *A. quadrimaculatus* larvae, and table 2 for culicine (*Psorophora* and *Culex* spp.) larvae.

TABLE 2.—*Number of culicine larvae per 10 dips for 6 plots for various treatments at different distances from water entrance*

Plot No.	Treatment		Flood period	Distance in feet from water entrance							
	Solvent	DDT (p. p. m.)		0–200	200–400	400–600	600–800	800–1,000	1,000–1,200	1,200–1,400	1,400–1,600
				Number of larvae per 10 dips							
I	X	0.1	1st	0	0	0.1	0.2	--------	--------	0	--------
	X	0.1	2nd	0	0	1.6	3.0	--------	--------	4.7	--------
Aver.[1]	--------	--------	--------	0	0	0.9	1.7	--------	--------	2.5	--------
II	X	0.05	1st	0	0	0	0	0	0	0	0
	B	0.2	2nd	0	0	0.1	0.1	1.6	0.5	1.0	4.7
Aver.[1]	--------	--------	--------	0	0	0.1	0.1	0.9	0.3	0.8	2.8
III	X	0.2	1st	0	0	0	0	0	0	0	0
	D	0.2	2nd	0	0	0	0	0	0	1.8	0.2
	BX	0.2	2nd	0	0	0	0.1	0	0.3	1.4	0.5
Aver.[1]	--------	--------	--------	0	0	0	0	0	0.1	1.4	0.4
IV	X	0.05	1st	0	--------	0	0	0.1	0.5	0.2	--------
	B	0.1	2nd	0	--------	0	1.6	2.0	1.8	1.8	--------
Aver.[1]	--------	--------	--------	0	--------	0	1.2	1.2	1.2	1.2	--------
V	X	0.2	1st	0	0	0	0	0	0	0	--------
	X	0.2	2nd	1.3	0.6	0.2	2.9	2.8	3.6	8.3	--------
Aver.[1]	--------	--------	--------	0.8	0.3	0.1	1.6	1.5	1.9	4.4	--------
VI	X	0.1	1st	0	0	0.2	0.1	0.3	0.9	0.4	0.2
	D	0.1	2nd	0	0	0.7	6.8	6.4	5.4	2.7	6.0
	BX	0.1	2nd	0.5	0.4	1.6	3.4	2.9	5.0	5.0	5.7
Aver.[1]	--------	--------	--------	0.2	0.1	0.8	2.9	2.7	3.3	3.1	3.5

[1] Averages weighted according to the number of samples per flood period.

Solvent legend:
X=Xylol
B=Culicide Oil B
BX=Culicide Oil B-xylol mixture
D=Dendrol

The average number of larvae per 10 dips for all of the inspection stations within each plot for the second flooding is given in table 3 for both *Anopheles* and culicine larvae. Also, there is given the mean distance of the stations to their respective water entrances and to the pump. These values, the average number of larvae per 10 dips for each plot, and the mean distance of the stations of each plot from the pump, are plotted in figure 5 for both *Anopheles* and culicines. Irrespective of the kind of treatment or the dosages of DDT, the average number of larvae increases as the distance from the pump increases, indicating that there is a reduction in toxicity depending on how far the plot is from the pump. Plots I and V received 0.1 p. p. m. DDT and 0.2 p. p. m. DDT, respectively, in xylol emulsion, yet plot V with a higher DDT dosage gave a larval count higher than plot I. Plots I, IV, and VI received 0.1 p. p. m. DDT, while plots II, III, and V received 0.2 p. p. m. DDT. (See table 3 and fig. 5.)

As can be seen by inspection of tables 1 and 2, stations near the water entrance have very low larval counts, or, in most cases, no

TABLE 3.—*Average number of larvae per 10 dips as obtained during the second flooding period and the average distance traveled by the irrigation water from applicator pump to sampling stations, averaged by plots*

	Plot No.					
	III	II	IV	I	V	VI
Average distance (feet) from stations to water entrance	750	824	660	609	596	890
Distance (feet) from water entrance to pump	84	400	990	1,350	2,412	2,732
Total mean distance (feet) from inspection stations to pump	834	1,224	1,650	1,959	3,008	3,622
Average number of *Anpoheles* larvae per 10 dips, second flooding	0.4	1.1	2.8	2.1	3.0	3.4
Average number of culicine larvae per 10 dips, second flooding	0.1	0.8	1.0	2.0	2.2	3.9

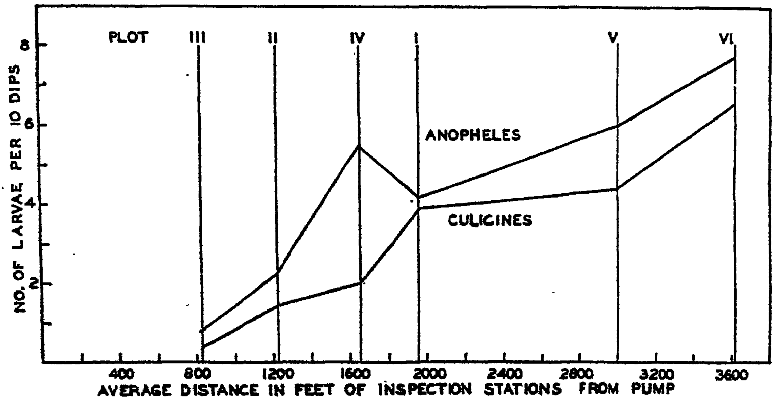

FIGURE 5.—Relation of plot position, distance from the pump, to toxicity of DDT larvicide as shown by larval counts. The curves shown are for data averaged by plots for the second flooding and including all treatments.

breeding. The average number of larvae per 10 dips for the combined 6 plots for each 200-foot interval is given in table 4 and plotted in figure 6. In this figure the increase in larval counts depends, in general, on the distance from the water entrance.

TABLE 4.—*Average number of larvae per 10 dips at 200-foot intervals from the water entrance for all plots, all treatments, and both flooding periods*

Kind of larvae	Distance in feet from water entrance							
	0–200	200–400	400–600	600–800	800–1,000	1,000–1,200	1,200–1,400	1,400–1,600
	Number of larvae per 10 dips							
Anopheles	0.5	0.5	1.4	2.2	2.9	2.8	3.4	1.9
Culicines	0.2	0.1	0.3	1.2	1.3	1.4	2.2	2.2

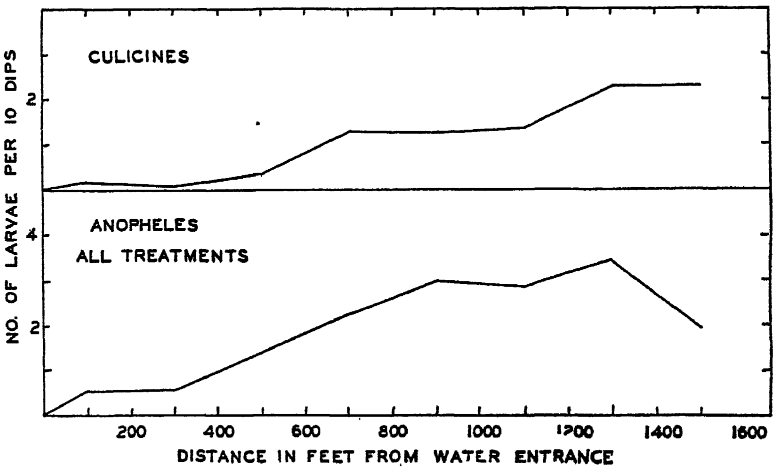

FIGURE 6.—Effect of all treatments on larval counts at different distances from the water entrance, as obtained from data for both flooding periods.

A comparison of the dosage of DDT for the various solvents used and their relation to the larval count and distance from the water entrance is plotted in figures 7, 8, 9, 10, and 11 from the data shown in tables 1 and 2. In general, the 0.2-p. p. m. DDT dosage shows lower larval counts than the 0.1-p. p. m. DDT dosage, and the decrease in toxicity with increase in distance is further emphasized.

To determine how the treatments were affecting the rice field in comparison with an untreated field, larval counts at four stations in the treated rice field and at four stations in an untreated adjacent rice field were made on two occasions, August 18 and September 5. The results are shown in table 5. The treated area shows 50 percent fewer *Anopheles* larvae and 72 percent fewer culicine larvae. In making this comparison, it should be noted that numerous *Gambusia* were seen in the untreated fields and none in the treated fields.

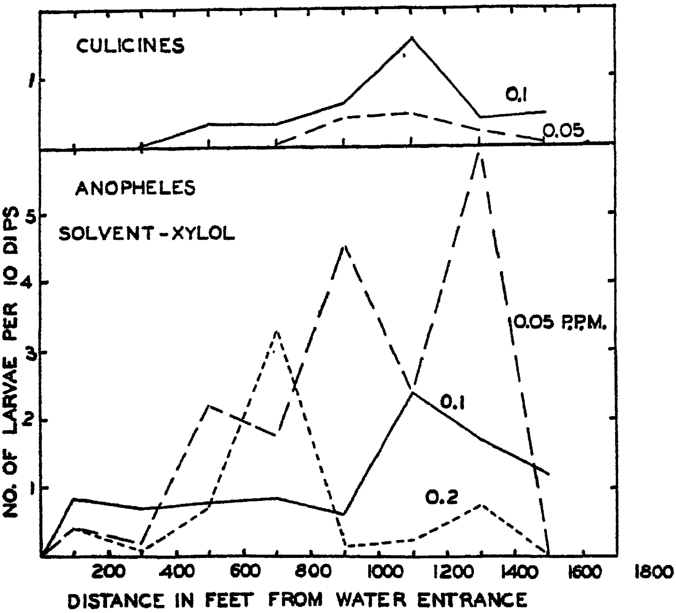

FIGURE 7.—Effects of various DDT dosages, using xylol as solvent, on larval counts at different distances from the water entrance, as obtained from data for the first flooding period.

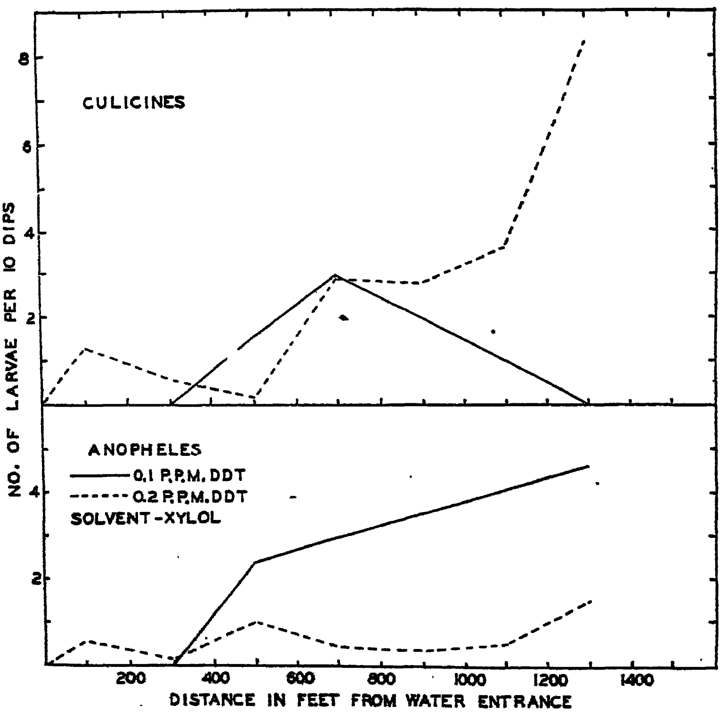

FIGURE 8.—Effects of two DDT dosages with xylol as solvent on larval counts at different distances from the water entrance, as obtained from data for the second flooding period.

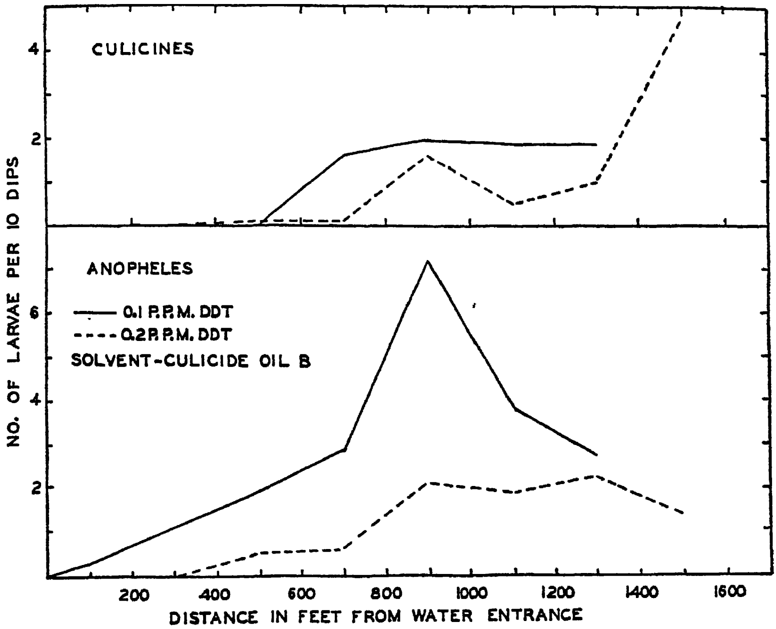

FIGURE 9.—Effects of two DDT dosages with Culicide Oil B as solvent on larval counts at different distances from the water entrance, as obtained from data for the second flooding period.

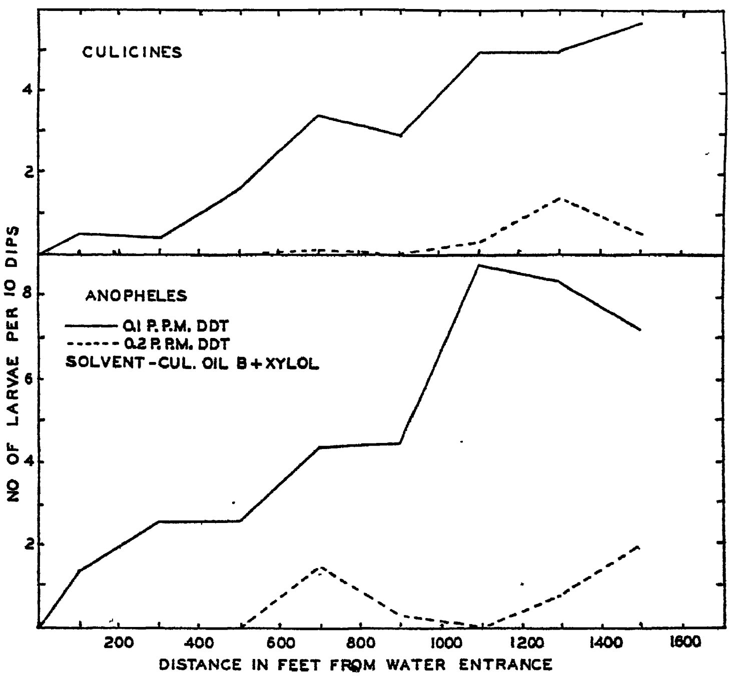

FIGURE 10.—Effects of two DDT dosages with combined xylol-Culicide Oil B solvent on larval counts at different distances from the water entrance, as obtained from data for the second flooding period.

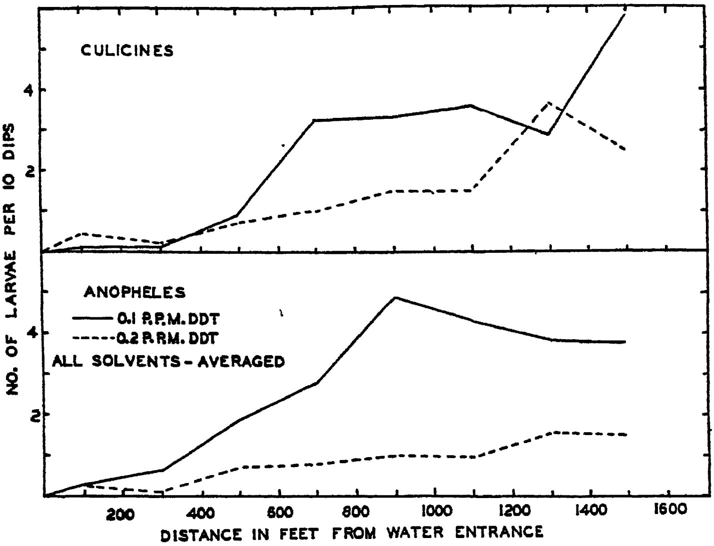

FIGURE 11.—Effects of two DDT dosages, with data for all solvents averaged, on counts at different distances from the water entrance, as obtained from data for the second flooding period.

TABLE 5.—*Comparison of larval counts, average number of larvae per 10 dips, in an untreated rice field and a field treated with DDT*

	Anopheles quadrimaculatus			Culicines (chiefly *Culex erraticus*)		
	Treated field	Untreated field	Percent reduction	Treated field	Untreated field	Percent reduction
First inspection, average	1.2	1.8	33.3	0.8	3.0	73.3
Second inspection, average	5.7	12.0	52.5	3.3	11.3	70.8
Average, both inspections	3.4	6.9	50.7	2.0	7.1	71.8

Because DDT was applied individually to each of the 30 small plots, the factor of distance from the point of application is eliminated and a direct correlation made between the number of larvae found and the DDT dosages. Larval counts made through the period are averaged as the number of larvae per 10 dips and the data arranged according to DDT dosages. These averages are shown in table 6 for various DDT dosages and for untreated plots. These data indicate that complete control of anopheline larvae is obtained at a DDT dosage of 1.0 p. p. m., and complete control of culicine larvae at a DDT dosage of 0.2 p. p. m. Table 7 shows that there was no residual toxicity when but one application of DDT was made.

Calculated yields in bushels per acre for small plots receiving various DDT dosages are shown in table 8 and indicate no significant differences among plots receiving various dosages or with the untreated plots. These data indicate that DDT treatments did not injure the rice, if yields can be taken as an index of injury.

TABLE 6.—*Average number of larvae per 10 dips correlated with various DDT dosages as applied to small plots*

Concentration of DDT in p. p. m.	0.1	0.2	1	10	100	0.2, followed by continuous flooding with water	0.2, followed by second flooding with water	Untreated
Number of plots included	5	5	3	3	1	3	3	3
Number of *Anopheles* larvae per 10 dips	1.01	0.14	0	0	0	2.82	5.59	2.20
Number of culicine larvae per 10 dips	0.34	0	0	0	0	0.48	0.33	0.94

TABLE 7.—*Average number of larvae per 10 dips at various time intervals in plots receiving 0.2 p. p. m. DDT in first flooding*

Days after second flooding	10	17	24	31	37	44	51
0.2 p. p. m., followed by continuous flooding with water alone	0.4	0.5	4.2	5.3	10.5	17.7	31.1
0.2 p. p. m., first flooding; second flooding with water alone	0.6	1.0	0.8	6.7	21.5	10.8	17.9
Controls (no DDT)	0.8	0.6	1.0	6.8	12.2	11.3	25.4

TABLE 8.—*Average yields for small plots for various DDT treatments*

Second flooding treatment (DDT p. p. m.)	100	10	1	1/5	1/10	Control
Yield (bushels per acre) (Zenith)	52.3	46.2	50.2	46.9	46.6	48.5

Effects of the DDT on the rice water weevil in the small experimental plots, as indicated by yields, are confused because of the readiness with which the adult weevil could migrate from plot to plot.

Sixty-two samples of soil taken from the small plots treated with DDT gave an average of 4.0 rice water weevil larvae per sample. Six samples taken and examined in a similar way from an untreated rice field showed 9.8 rice water weevil larvae, indicating that DDT-treated plots contained approximately 50 percent fewer rice water weevil larvae than did untreated fields.

Also, the adult rice water weevils were affected. Although no counts were made, many dead adults were seen when dipping for mosquito larvae.

Yields from the six field plots which were treated with DDT were obtained in order to estimate the injury, if any, of the DDT treatment. Yields as determined by the Rice Experiment Station are shown in table 9.

These yields are considered by the Experiment Station to be satisfactory and indicate that the rice suffered no injury from the DDT treatments. A comparison of these yields with those given by Adair, Kapp, and Cralley (*3*) for previous years on unspecified and untreated plots at the Stuttgart Experiment Station shows that the 100-acre DDT-treated field gave higher yields for each variety of

rice than the average or the highest yields reported by Adair, Kapp, and Cralley. Although better rice water weevil control, because of the DDT treatments, may have been the factor or one of the factors responsible for the increased yields, it is difficult to assign increased yields to any single factor or combination of factors because of the design of the experiment, which did not provide untreated fields.

TABLE 9.—*Yields of rice in bushels per acre for each of the six plots in the 100-acre rice field treated with DDT emulsion larvicide. The average and highest yields* (3) *on other fields at the Experiment Station for past years are shown for comparison*

Variety of rice	100-acre DDT-treated field		Untreated and unspecified plots		
	Plot No.	Yield (bushels per acre)	Years	Average yield (bushels per acre)	Highest yield (bushels per acre)
Arkansas Fortuna	1	[1] 70	1934–43	50.5	64.5
Early Nira	2	[1] 70	1935–43	44.7	55.0
Zenith	3	[1] 95	1934–43	52.7	64.8
Prelude	4	[2] 82	1940–43	55.8	58.1
Arkrose	5	[2] 66	1940–43	48.2	59.0
Kamrose	6	[1] 90	1941–43	51.6	60.3

[1] Yields on volume basis (combine).
[2] Yields on dry weight basis (binder and thresher).

SUMMARY AND CONCLUSIONS

A method of applying a DDT water emulsion at the pump to flooding waters of a rice field is described. Data obtained from 28,000 dipping records of mosquito larval counts are given according to DDT dosage, solvent used, and position of plot. Larval counts increased with the distance from the pump, indicating a gradual loss in the toxicity of the DDT-treated water as it flowed through the canals and rice fields.

In comparison with an untreated rice field, two plots of the treated field contained 50 percent fewer *A. quadrimaculatus* larvae and 72 percent fewer culicine larvae than the untreated field. In a series of 1/20-acre plots, complete control of anopheline and culicine larvae was obtained at DDT concentrations of 1.0 p. p. m. and 0. 2 p. p. m. respectively.

Samples of rice stools from treated and untreated fields showed approximately 50 percent fewer rice water weevil larvae in the treated than in the untreated field.

Yields of harvested rice in the DDT-treated 100-acre field were higher than the average or highest yields for previous years, from untreated fields, and indicate that DDT did not injure the growing rice.

Although these results indicate a reduction of mosquito larvae production by the application of DDT to the flooding water as it

enters the rice fields, it is well to note that this production of mosquito larvae was by no means eliminated.

ACKNOWLEDGMENTS

To John E. Taylor, State Director of Malaria Control for the State of Arkansas; to Senior Sanitary Engineer Mark D. Hollis, Officer in Charge, Malaria Control in War Areas; to Senior Surgeon V. H. Haas, Medical Officer in Charge, Malaria Investigations, acknowledgment is made for their interest and advice and the facilities afforded for pursuing the study.

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(*1*) Horsfall, Wm. R.: Biology and Control of Mosquitoes in the Rice Area. Bull. No. 427, Arkansas Agric. Exp. Sta., 1942.
(*2*) Isely, Dwight, and Schwardt, H. H.: The Rice Water Weevil. Bull. No. 299, Arkansas Agric. Exp. Sta., 1934.
(*3*) Adair, C. R., Kapp, L. C., and Cralley, E. M.: Rice Variety Experiments. Arkansas Agric. Exp. Sta., 1944.

MALARIA

Number of Cases Reported by State Health Officers, January Through April 1945, as Compared With the Data for the Same Period in 1939–44

Beginning in 1943, certain States, especially in the northern part of the United States, reported a sharp increase in the number of new cases of malaria. In 1944 and 1945, the increase was more marked. This increase could have been due either to the inclusion in the malaria reports of cases which had been contracted overseas by the military population or to a rising incidence of malaria in the civilian population. To determine the source of the increase, it is necessary to know the number of cases of malaria contracted outside of the continental United States. Therefore the State health officers were asked to report cases of malaria in this manner, beginning with January 1945.

The accompanying table shows, for January through April of 1945 and for the same period of 1939–44, the number of cases of malaria reported in the several States. The figures for 1939 through 1942 may be considered as civilian cases contracted in this country. The data for 1943 are believed to contain some cases in the military population. Only a few State health officers in 1944 reported separately cases in the military and civilian populations.

For the first 4 months of 1945, the health officers of most States have reported malaria cases either as requested (contracted within and contracted outside continental United States) or separately for the military and civilian populations. The cases reported for the military population have been considered as contracted outside continental United States. A few State health officers have stated that all cases

Number of cases of malaria for January through April of 1945 and of 1939–44 (from monthly reports furnished by the State health officers)

Division and State	Total cases reported									
	1939	1940	1941	1942	1943	1944	1945			
							Total	Place contracted		Information not supplied
								Within continental United States	Outside continental United States[1]	
New England:										
Maine	0	0	0	0	0	1	3	1	2	--------
New Hampshire	0	0	1	0	0	1	0	0	0	--------
Vermont	0	0	0	0	0	0	0	0	0	--------
Massachusetts	4	4	2	1	2	205	321	--------	183	138
Rhode Island	0	0	0	0	1	26	93	--------	91	2
Connecticut	1	1	2	0	2	23	44	5	39	--------
Middle Atlantic:										
New York	24	50	20	34	26	36	386	5	381	--------
New Jersey	4	1	2	5	2	102	559	1	558	--------
Pennsylvania	0	0	0	1	2	1	0	0	0	--------
East North Central:										
Ohio	1	4	3	2	9	26	9	1	8	--------
Indiana	2	4	0	0	6	190	398	4	394	--------
Illinois	23	45	9	8	16	9	1	1	0	--------
Michigan	0	16	1	3	56	126	46	1	31	14
Wisconsin	0	2	0	0	0	10	132	--------	--------	132
West North Central:										
Minnesota	2	1	0	1	0	11	34	0	34	--------
Iowa	0	3	1	0	2	3	12	1	11	--------
Missouri	7	12	15	7	17	7	136	22	114	--------
North Dakota	0	0	0	0	1	0	0	0	0	--------
South Dakota	1	0	0	0	0	0	0	0	0	--------
Nebraska	0	0	0	0	0	2	0	0	0	--------
Kansas	3	3	4	1	0	12	20	0	20	--------
South Atlantic:										
Delaware	0	0	0	0	0	0	17	0	17	--------
Maryland	1	0	0	1	7	0	310	2	307	1
District of Columbia	0	0	0	0	16	24	50	0	50	--------
Virginia	8	15	6	2	15	134	293	1	134	158
West Virginia	0	1	2	1	0	1	50	0	50	--------
North Carolina	158	29	42	28	42	76	148	--------	--------	148
South Carolina	1,844	1,278	1,232	1,136	1,243	1,660	2,440	--------	--------	2,440
Georgia	396	206	141	80	70	45	168	91	77	--------
Florida	95	35	20	7	16	66	417	12	405	--------
East South Central:										
Kentucky	8	2	6	1	0	9	567	1	566	--------
Tennessee	60	109	35	11	14	10	50	15	35	--------
Alabama	389	389	203	283	569	244	678	440	238	--------
Mississippi	5,014	5,237	4,331	4,538	3,843	3,379	3,656	3,498	158	--------
West South Central:										
Arkansas	533	336	226	207	78	169	356	146	210	--------
Louisiana	69	29	79	56	60	135	554	98	372	84
Oklahoma	184	175	188	144	164	190	219	122	5	92
Texas	581	911	1,182	1,200	1,451	1,798	2,428	1,293	1,135	--------
Mountain:										
Montana	1	0	0	1	0	8	9	1	8	--------
Idaho	0	0	0	2	1	2	0	0	0	--------
Wyoming	0	0	1	0	0	1	4	0	4	--------
Colorado	0	0	0	1	4	15	283	--------	216	67
New Mexico	3	3	0	4	1	1	29	1	28	--------
Arizona	2	9	5	9	5	16	36	--------	27	9
Utah	0	1	0	1	4	9	61	1	60	--------
Nevada	0	0	0	0	0	1	0	0	0	--------
Pacific:										
Washington	0	0	0	0	2	0	1	0	1	--------
Oregon	2	3	2	2	7	6	52	--------	1	51
California	27	27	35	12	92	705	537	15	491	31
Total	9,447	8,941	7,796	7,790	7,846	9,495	15,607	5,779	6,461	3,367

[1] Includes cases reported for the military population, considered as contracted outside continental United States.

A zero indicates a definite report. Leaders indicate that there may have been cases.

of malaria reported by them are in the civilian population. These cases have been considered as contracted within continental United States. In instances where the State health officer did not specify where the cases of malaria were contracted or whether they were among the military or civilian population, the cases have been shown in the table in the column headed "information not supplied."

For those States where the origin of all cases of malaria is known for 1945, a comparison of the number of cases contracted within continental United States with the number for the years 1939–42 indicates that there has been no increase in the incidence of malaria in this country. Four States—Maine, Connecticut, Missouri, and Louisiana—show a few more cases for 1945 than for the previous years. However, three States—New York, Illinois, and Mississippi—have fewer cases reported in 1945 than for any year between 1939 and 1942. The data presented here do not warrant the conclusion that malaria has decreased in certain States. Changes in the size and age distribution of the population must be taken into account before any such conclusions can be reached.

DEATHS DURING WEEK ENDED AUGUST 4, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 4, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,152	8,140
Average for 3 prior years	7,942	
Total deaths, first 31 weeks of year	284,318	288,023
Deaths under 1 year of age	604	654
Average for 3 prior years	625	
Deaths under 1 year of age, first 31 weeks of year	18,846	19,218
Data from industrial insurance companies:		
Policies in force	67,374,816	66,691,894
Number of death claims	11,553	11,584
Death claims per 1,000 policies in force, annual rate	8.9	9.1
Death claims per 1,000 policies, first 31 weeks of year, annual rate	10.6	10.3

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 11, 1945

Summary

A total of 671 cases of poliomyelitis was reported for the week, as compared with 474 last week, a 5-year median of 420, and 1,016 for the corresponding week last year, an increase of 84 over the preceding week. Increases occurred during the current week in all of the 9 geographic divisions except the Pacific. States reporting increases of 10 or more cases each during the week are as follows (last week's figures in parentheses): Maine 12 (2), Massachusetts 28 (15), New York 111 (83), Pennsylvania 45 (31), Illinois 73 (26), Nebraska 13 (0), District of Columbia 13 (3), Virginia 27 (15), and Texas 56 (38). Decreases occurred in New Jersey (82 to 71) and California (18 to 10).

During the 10-week period June 3 to August 11, 2,773 cases have been reported, as compared with 4,463 for the corresponding period last year. The total for the year to date is 3,584, as compared with 5,008 for the same period last year and a 5-year median of 2,272.

Of the total of 92 cases of meningococcus meningitis, as compared with 118 last week, only 2 States reported as many as 8 cases each—New York and Texas. A total of 158 cases was reported for the corresponding week last year, and the 5-year median is 47. The total to date is 6,091, as compared with 12,944 for the corresponding period last year and a 5-year median of 2,354.

Of a total of 703 cases of unspecified dysentery, 620 occurred in Virginia where 634 cases were reported last week, and 292 for the next earlier week. Of 652 cases of bacillary dysentery, 409 occurred in Texas and 110 in Connecticut.

Deaths recorded in 93 large cities of the United States totaled 7,918 for the current week, as compared with 8,152 last week, 8,223 for the corresponding week of 1944, and a 3-year (1942–44) average of 7,867. The total to date this year is 292,236, as compared with 296,246 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 11, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944	
NEW ENGLAND												
Maine	5	3	0	------	------	------	3	2	12	0	0	0
New Hampshire	0	0	0	------	------	------	1	0	0	0	1	0
Vermont	2	0	0	------	------	------	1	4	14	0	0	0
Massachusetts	4	1	3	------	------	------	80	46	83	0	8	3
Rhode Island	0	0	0	25	------	------	0	0	4	1	0	0
Connecticut	1	1	0	------	------	------	12	9	9	3	4	1
MIDDLE ATLANTIC												
New York	8	6	7	(1)	[1] 1	[1] 1	26	129	208	8	22	9
New Jersey	1	3	1	1	1	2	19	38	66	0	9	6
Pennsylvania	10	7	7	1	------	------	106	34	47	6	12	2
EAST NORTH CENTRAL												
Ohio	4	1	2	1	1	3	12	21	32	7	8	2
Indiana	5	5	5	6	3	2	7	5	6	4	1	1
Illinois	0	4	11	------	4	2	85	18	40	6	8	1
Michigan [2]	7	9	2	1	------	1	62	37	88	5	8	2
Wisconsin	2	1	0	9	14	7	35	144	144	1	3	0
WEST NORTH CENTRAL												
Minnesota	4	4	0	------	1	------	3	12	12	1	1	0
Iowa	4	3	2	------	------	------	9	2	11	1	4	0
Missouri	0	1	1	3	1	1	7	29	16	0	11	0
North Dakota	5	0	0	------	------	------	0	0	5	0	0	0
South Dakota	6	0	1	------	------	------	1	0	2	0	0	0
Nebraska	3	1	1	------	2	2	5	12	10	0	0	0
Kansas	4	2	2	------	------	------	10	6	10	2	1	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	0	0	1	1	0
Maryland [2]	3	0	2	------	1	1	0	1	5	2	5	2
District of Columbia	1	0	0	------	1	------	1	6	6	3	1	0
Virginia	6	9	9	74	23	37	4	11	20	1	2	2
West Virginia	1	10	4	4	------	1	0	1	5	2	4	0
North Carolina	25	11	10	------	------	------	7	31	31	3	2	1
South Carolina	12	5	7	86	57	101	11	8	8	0	0	1
Georgia	11	5	7	6	5	16	1	4	6	2	3	1
Florida	6	4	2	2	------	1	4	4	4	0	4	1
EAST SOUTH CENTRAL												
Kentucky	3	3	3	------	1	1	3	13	13	2	2	1
Tennessee	3	5	4	4	9	6	1	2	9	4	3	0
Alabama	12	5	8	33	3	9	3	3	8	1	3	2
Mississippi [2]	12	7	3	------	------	------	------	------	------	4	3	2
WEST SOUTH CENTRAL												
Arkansas	3	4	4	2	12	12	4	4	4	5	0	0
Louisiana	7	3	3	56	5	3	3	4	4	0	0	0
Oklahoma	3	1	1	12	2	6	6	22	10	0	0	0
Texas	29	30	22	376	210	201	50	75	52	8	3	2
MOUNTAIN												
Montana	0	1	1	------	------	------	9	1	3	0	1	0
Idaho	2	0	0	4	------	------	25	6	3	0	0	0
Wyoming	0	4	2	------	------	------	2	2	5	0	1	1
Colorado	0	4	4	------	4	9	0	5	5	0	2	0
New Mexico	3	7	1	------	------	------	0	2	4	0	0	0
Arizona	3	2	1	12	8	18	1	8	9	0	2	1
Utah [2]	0	0	0	4	------	------	54	7	12	0	2	0
Nevada	0	1	0	------	------	------	0	9	5	0	0	0
PACIFIC												
Washington	1	0	1	------	2	------	40	26	21	2	0	0
Oregon	2	2	2	3	3	3	13	45	25	1	2	3
California	29	20	10	6	6	17	196	291	126	6	11	4
Total	252	195	165	731	380	451	922	1,139	1,539	92	158	47
32 weeks	8,070	6,580	7,241	70,229	338,114	168,789	100,565	590,181	535,598	6,091	12,944	2,354

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended August 11, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944		Aug. 11, 1945	Aug. 12, 1944	
NEW ENGLAND												
Maine	12	0	0	10	14	2	0	0	0	1	0	0
New Hampshire	0	0	0	2	0	2	0	0	0	0	0	0
Vermont	2	3	1	2	1	3	0	0	0	0	1	0
Massachusetts	28	23	1	43	47	47	0	0	0	3	8	3
Rhode Island	0	1	0	2	0	0	0	0	0	0	1	0
Connecticut	11	10	2	7	4	4	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	111	356	30	97	54	54	0	0	0	8	9	16
New Jersey	71	21	13	18	16	18	0	0	0	7	1	4
Pennsylvania	45	72	3	31	36	36	0	0	0	11	3	10
EAST NORTH CENTRAL												
Ohio	14	57	16	54	82	49	0	0	0	3	2	8
Indiana	12	33	12	13	12	10	0	1	1	2	5	5
Illinois	73	27	27	28	46	35	0	0	0	3	3	6
Michigan[1]	8	53	10	51	39	35	0	1	0	0	4	4
Wisconsin	6	8	1	37	52	35	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	2	24	7	25	14	13	0	0	0	0	2	1
Iowa	6	13	5	8	13	9	0	0	0	0	0	5
Missouri	5	2	4	5	4	12	0	0	0	2	4	7
North Dakota	0	2	1	2	0	3	0	2	0	1	0	0
South Dakota	0	0	0	11	3	4	2	6	1	1	2	0
Nebraska	13	4	1	8	3	3	0	0	0	0	0	0
Kansas	3	9	9	23	7	15	0	0	0	1	4	4
SOUTH ATLANTIC												
Delaware	3	9	0	2	1	0	0	0	0	0	0	0
Maryland[1]	4	26	2	8	16	10	0	0	0	1	3	3
District of Columbia	13	10	1	3	4	3	0	0	0	0	0	1
Virginia	27	35	3	18	12	12	0	0	0	8	4	8
West Virginia	0	15	4	22	24	14	0	0	0	3	10	6
North Carolina	7	60	5	14	23	23	0	0	0	2	4	4
South Carolina	13	6	2	7	1	1	0	0	0	4	4	4
Georgia	8	5	1	15	12	7	0	0	0	16	15	15
Florida	3	0	0	3	2	2	0	0	0	5	7	6
EAST SOUTH CENTRAL												
Kentucky	0	47	13	17	13	13	0	0	0	11	17	17
Tennessee	24	9	9	13	9	9	0	0	0	3	6	10
Alabama	8	6	2	17	13	8	0	0	0	3	3	9
Mississippi[1]	3	5	2	7	3	4	0	0	0	4	2	11
WEST SOUTH CENTRAL												
Arkansas	2	2	3	7	3	3	0	0	0	0	4	15
Louisiana	2	11	5	3	2	1	0	0	0	3	5	8
Oklahoma	18	3	3	5	2	5	0	0	0	6	6	6
Texas	56	7	7	30	27	22	1	0	0	20	16	20
MOUNTAIN												
Montana	1	1	1	4	3	5	0	0	0	0	0	1
Idaho	0	1	0	2	4	1	1	0	0	1	0	0
Wyoming	0	0	0	0	0	1	0	0	0	0	0	0
Colorado	7	2	1	10	5	7	0	0	0	2	0	1
New Mexico	2	0	0	0	0	1	0	0	0	0	1	2
Arizona	0	3	2	2	1	1	0	0	0	0	1	1
Utah[1]	18	2	2	2	6	5	0	0	0	1	0	0
Nevada	1	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	17	1	3	15	11	8	0	0	0	1	0	0
Oregon	2	20	2	0	7	6	0	1	0	1	1	1
California	10	11	11	111	60	36	0	0	0	2	3	4
Total	671	1,016	420	814	711	593	4	11	7	140	161	218
32 weeks	3,584	5,008	2,272	133,818	146,942	96,866	265	299	609	2,621	3,087	3,813

[1] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately as follows: New Jersey 1; Ohio 1; Illinois 1; South Dakota 1; South Carolina 1; Georgia 10; Tennessee 1; Louisiana 1; Texas 3.

Telegraphic morbidity reports from State health officers for the week ended August 11, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Whooping cough			Week ended Aug. 11, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Aug. 11, 1945	Aug. 12, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	26	18	20	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0
Vermont	21	39	39	0	0	0	0	0	0	0	1
Massachusetts	133	57	147	0	2	0	0	0	0	0	0
Rhode Island	11	2	13	0	1	0	0	0	0	0	0
Connecticut	37	54	36	0	110	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	317	178	272	0	4	0	1	0	0	0	3
New Jersey	197	68	99	0	0	0	0	0	0	0	1
Pennsylvania	240	80	216	0	0	0	0	1	0	0	2
EAST NORTH CENTRAL											
Ohio	196	257	243	1	0	0	0	0	0	0	1
Indiana	34	29	29	0	1	0	1	3	0	0	1
Illinois	131	148	190	4	0	0	1	1	0	0	8
Michigan [2]	111	106	264	2	4	0	0	0	0	0	5
Wisconsin	55	176	220	0	0	0	1	0	0	0	7
WEST NORTH CENTRAL											
Minnesota	21	42	51	1	0	0	0	0	0	0	5
Iowa	9	5	42	0	0	0	0	0	0	0	1
Missouri	34	20	20	0	0	0	0	1	2	0	0
North Dakota	3	70	13	0	0	0	0	0	0	0	0
South Dakota	0	0	4	0	0	0	0	0	0	0	0
Nebraska	1	9	9	0	0	0	0	0	0	0	0
Kansas	20	42	50	0	0	0	2	0	0	0	0
SOUTH ATLANTIC											
Delaware	0	4	3	0	0	0	0	0	0	0	0
Maryland [2]	69	124	118	0	0	3	0	0	0	0	1
District of Columbia	15	1	12	0	0	0	0	0	0	0	0
Virginia	53	53	53	0	0	620	0	4	2	0	2
West Virginia	20	29	43	0	0	0	0	0	0	0	0
North Carolina	133	215	146	0	15	0	0	8	0	6	1
South Carolina	67	77	71	2	71	0	0	0	0	10	0
Georgia	26	12	12	1	7	0	0	0	1	45	3
Florida	11	14	14	1	1	1	0	0	0	16	1
EAST SOUTH CENTRAL											
Kentucky	28	54	54	0	0	0	0	2	0	0	0
Tennessee	31	19	54	0	0	5	2	1	0	2	0
Alabama	37	9	9	0	0	0	0	1	0	18	2
Mississippi [2]	------	------	--------	0	0	0	0	0	1	6	5
WEST SOUTH CENTRAL											
Arkansas	26	11	14	1	14	0	0	0	3	1	3
Louisiana	35	0	13	0	2	0	0	0	0	12	0
Oklahoma	16	13	16	0	3	0	0	0	0	0	1
Texas	179	245	191	19	409	48	0	0	2	75	13
MOUNTAIN											
Montana	3	16	17	0	0	0	0	0	1	0	0
Idaho	4	3	3	0	0	0	0	1	1	0	3
Wyoming	12	11	5	0	0	0	0	0	1	0	0
Colorado	68	17	20	0	0	0	0	0	0	0	0
New Mexico	2	2	4	0	1	0	0	0	0	0	0
Arizona	5	20	13	0	0	26	0	0	0	0	1
Utah [2]	36	62	55	0	0	0	0	0	1	0	4
Nevada	0	3	3	0	0	0	0	0	1	0	0
PACIFIC											
Washington	36	14	40	1	0	0	0	0	0	0	1
Oregon	16	2	30	0	0	0	0	0	0	0	1
California	219	53	155	1	7	0	10	0	0	0	4
Total	2,744	2,483	3,302	34	652	703	18	23	16	191	82
Same week, 1944	2,483	------	--------	62	724	284	12	25	8	198	73
Average, 1942–44	2,956	------	--------	44	515	326	18	[4] 25	16	[4] 131	------
32 weeks: 1945	82,149	------	--------	1,158	15,608	5,673	260	329	508	2,501	3,029
1944	61,317	------	--------	1,062	13,448	4,869	362	348	375	2,499	2,252
Average, 1942–44	103,166	------	[4] 119,319	1,018	9,483	4,398	353	[4] 348	530	[4] 1,670	------

[2] Period ended earlier than Saturday.
[4] 5-year median 1940–44.

Anthrax: New Jersey 1. *Leprosy:* Louisiana 1.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 4, 1945

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	0	2	0	0	0	5
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	1	0	0	0
Massachusetts:												
Boston	0	0	------	0	18	1	6	6	11	0	0	27
Fall River	0	0	------	0	0	0	1	0	0	0	0	1
Springfield	0	0	------	0	1	0	1	0	3	0	0	3
Worcester	0	0	------	0	16	0	4	0	1	0	0	1
Rhode Island:												
Providence	0	0	------	1	0	0	2	0	0	0	0	4
Connecticut:												
Bridgeport	0	0	------	0	0	0	1	0	0	0	0	0
Hartford	0	0	------	0	0	0	1	0	0	0	0	1
New Haven	0	0	------	1	0	1	0	1	0	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	5	5	3	0	0	6
New York	7	2	------	2	21	10	34	35	23	0	7	147
Rochester	0	0	------	0	1	0	2	14	3	0	0	22
Syracuse	0	0	------	0	0	0	1	0	0	0	0	35
New Jersey:												
Camden	1	0	------	0	0	0	1	0	0	0	0	1
Newark	0	0	------	0	3	0	4	1	0	0	3	25
Trenton	0	0	------	0	0	0	2	21	0	0	0	8
Pennsylvania:												
Philadelphia	1	0	1	0	44	1	13	8	7	0	2	100
Pittsburgh	0	0	1	1	0	0	6	0	8	0	0	20
Reading	0	0	------	0	0	0	1	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	2	0	8	0	3	0	0	11
Cleveland	0	0	------	1	1	1	5	1	6	0	1	54
Columbus	0	0	------	0	1	1	0	2	4	0	0	8
Indiana:												
Fort Wayne	0	0	------	0	0	0	0	0	0	0	1	0
Indianapolis	0	0	------	0	2	0	2	0	1	0	0	5
South Bend	1	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	1	0	1	0	0	0
Illinois:												
Chicago	1	0	------	0	70	1	19	5	14	0	0	77
Springfield	0	0	------	0	1	0	0	0	1	0	0	0
Michigan:												
Detroit	3	0	------	0	33	3	6	2	10	0	0	55
Flint	0	0	------	0	3	0	1	0	8	0	0	0
Grand Rapids	0	0	------	0	1	0	0	0	0	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	0
Milwaukee	0	0	------	0	6	1	2	0	7	0	0	0
Racine	0	1	------	0	0	0	0	0	0	0	0	6
Superior	0	0	------	0	0	0	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	0	0	4	0	0	0
Minneapolis	1	0	------	1	0	0	2	1	4	0	0	2
St. Paul	1	0	------	0	1	0	3	0	1	0	0	7
Missouri:												
Kansas City	0	0	------	0	0	0	2	1	5	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	2	0	0	0
St. Louis	0	3	------	0	10	1	6	2	3	0	2	17
North Dakota:												
Fargo	0	0	------	0	0	0	0	0	0	0	0	0

City reports for week ended August 4, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	2	0	------	0	0	1	0	0	1	0	0	0
Kansas:												
Topeka	0	0	------	0	0	0	2	1	0	0	0	4
Wichita	0	0	------	0	0	0	4	0	1	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	0	1	0	0	0	1
Maryland:												
Baltimore	6	0	------	0	0	0	7	1	5	0	0	45
Cumberland	0	0	------	0	0	0	0	0	0	0	0	3
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	1	3	3	7	0	0	16
Virginia:												
Lynchburg	0	0	------	0	0	0	1	0	0	0	1	1
Richmond	0	0	------	0	0	0	1	16	0	0	0	1
Roanoke	1	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	0	0	0	0	0	0	2
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	0	0	0	2
Wilmington	1	0	------	0	0	0	1	0	1	0	0	3
Winston-Salem	1	0	------	0	0	0	0	0	1	0	0	10
South Carolina:												
Charleston	0	0	------	0	0	0	1	0	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	5	1	2	0	0	0
Brunswick	0	0	------	0	1	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	3	1	3	2	8	3	1	0	0	13
Nashville	0	0	------	0	0	0	1	3	0	0	0	9
Alabama:												
Birmingham	0	0	1	0	0	1	1	3	0	0	0	2
Mobile	0	0	------	0	0	0	0	0	3	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	1	0	0	0
Louisiana:												
New Orleans	3	0	------	0	4	1	4	1	0	0	0	1
Shreveport	2	0	------	0	0	0	2	3	0	0	1	0
Texas:												
Dallas	4	0	------	0	1	0	1	0	3	0	0	10
Galveston	0	0	------	0	0	0	0	2	0	0	0	0
Houston	4	0	------	0	0	2	5	6	3	0	1	5
San Antonio	0	0	------	0	0	1	0	2	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	0	0	0	0
Great Falls	0	0	------	0	0	0	0	0	1	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	1	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	2	0	3	0	3	3	4	0	0	34
Pueblo	2	0	------	0	1	0	2	0	0	0	0	2
Utah:												
Salt Lake City	0	0	------	0	16	0	4	2	1	0	0	11

City reports for week ended August 4, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0	------	0	32	1	2	0	1	0	0	9
Spokane	0	0	------	0	2	0	0	1	0	0	0	18
Tacoma	0	0	------	0	8	0	3	0	0	0	0	2
California:												
Los Angeles	3	0	1	1	32	0	2	3	20	0	0	43
Sacramento	0	0	------	0	3	0	1	1	2	0	0	3
San Francisco	1	0	------	0	47	3	7	4	8	0	0	9
Total	48	6	9	9	391	34	214	167	202	0	19	912
Corresponding week, 1944	37	------	14	8	299	------	244	------	207	0	25	600
Average, 1940–44	39	------	24	[1] 6	[2] 516	------	[1] 238	------	205	0	36	1,115

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Anthrax.—Cases: Camden, 1.
Dysentery, amebic.—Cases: New York, 3; Los Angeles, 1.
Dysentery, bacillary.—Cases: Detroit, 1; Charleston, S. C., 9: Nashville, 1.
Dysentery, unspecified.—Cases: St. Paul, 4: Richmond, 1; San Antonio, 22.
Rocky Mountain spotted fever.—Cases: Richmond, 3.
Tularemia.—Cases: San Antonio, 1.
Typhus fever, endemic.—Cases: Wilmington, N. C., 1; Atlanta, 1; Savannah, 8; Birmingham, 1; Mobile, 5, New Orleans, 2; Shreveport, 1; Houston, 11; San Antonio, 3.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,190,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	0.0	5.3	92	5.3	42.0	23.6	42	0.0	0.0	118
Middle Atlantic	4.2	0.9	0.9	1.4	32	5.1	31.9	38.9	21	0.0	5.6	168
East North Central	3.0	0.6	0.0	0.6	73	4.3	26.8	6.1	34	0.0	1.2	131
West North Central	8.0	6.0	0.0	2.0	24	4.0	37.8	9.9	42	0.0	4.0	62
South Atlantic	15.7	0.0	0.0	0.0	3	1.7	33.1	38.3	28	0.0	1.7	146
East South Central	0.0	0.0	23.6	5.9	18	17.7	59.0	53.1	24	0.0	0.0	142
West South Central	37.3	0.0	0.0	0.0	14	11.5	37.3	40.2	20	0.0	5.7	49
Mountain	23.8	0.0	15.9	0.0	167	0.0	71.5	39.7	48	0.0	0.0	373
Pacific	7.9	0.0	1.6	1.6	196	6.3	23.7	14.2	49	0.0	0.0	133
Total	7.3	0.9	1.4	1.4	60	5.2	32.7	25.5	31	0.0	2.9	139

PLAGUE INFECTION IN KERN AND SANTA CLARA COUNTIES, CALIF.

Under date of August 2, plague infection was reported proved on July 31 in a pool of 200 fleas and 87 lice from 35 ground squirrels, *C. beecheyi*, shot on the east side of Castair Lake, 1½ miles east and ½ mile north of Lebec, Kern County, Calif., and, under date of August 7, to have been proved on August 3 in a pool of 150 fleas from 35 ground squirrels, same species, shot 5 miles east and 1½ miles north of Gilroy, Santa Clara County, and submitted to the laboratory on July 16.

TERRITORIES AND POSSESSIONS

Virgin Islands of the United States

Notifiable diseases—April–June 1945.—For the months of April, May, and June 1945, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	April	May	June	Disease	April	May	June
Chickenpox	2	2	1	Schistosomiasis		1	
Gonorrhea	13	10	15	Syphilis	11	54	10
Granuloma inguinale		1	2	Tuberculosis		6	2
Hookworm disease	6	3	2	Typhoid fever			1
Measles	40	97	2	Typhus fever	2	2	
Pellagra	1			Vincent's infection			1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended July 21, 1945.—During the week ended July 21, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		17	2	71	104	41	18	72	41	366
Diphtheria		5	4	45	12	1	2			69
Dysentery:										
Bacillary				4					9	13
Unspecified					4					4
German measles		2		2	8		1	24	5	42
Influenza		2			14	1			10	27
Measles		1		41	125	6	9	22	59	263
Meningitis, meningococcus				3				1		4
Mumps		4		42	58	14	3	20	23	164
Poliomyelitis		1			3	1		1	4	10
Scarlet fever		2	1	95	53	11	1	8	13	184
Tuberculosis (all forms)		5	7	124	71	8	1	2	15	233
Typhoid and paratyphoid fever				10	2	1				13
Undulant fever				1						1
Venereal diseases:										
Gonorrhea		28	37		155	45	31	53	95	444
Syphilis		13	7		78	13	6	15	36	168
Whooping cough		3	33	108	29	3		7	3	186

CHINA

Notifiable diseases—April 1945.—During the month of April 1945, certain notifiable diseases have been reported by the Army Medical Administration, Health Department of the Board of Supplies and Transport, the Chinese Red Cross Medical Corps and the National Health Administration of China, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	485	33	Scarlet fever	11	
Cholera	2		Smallpox	220	17
Diphtheria	20		Typhoid fever	388	13
Dysentery, unspecified	856	8	Typhus fever	384	13
Relapsing fever	983	15			

NEW ZEALAND

Notifiable diseases—4 weeks ended July 14, 1945.—During the 4 weeks ended July 14, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	16	1	Ophthalmia neonatorum	1	
Diphtheria	112	3	Puerperal fever	3	
Dysentery, bacillary	30	4	Scarlet fever	522	
Erysipelas	20		Tetanus	1	
Food poisoning	2		Tuberculosis (all forms)	167	50
Influenza	1	1	Typhoid fever	4	
Lethargic encephalitis	1	1	Undulant fever	4	
Malaria	30				

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January-May 1945	June 1945	July 1945—week ended— 7	14	21	28
ASIA							
China:							
Kweichow Province—Kweijang	C				12		
Szechwan Province—							
Chengtu	C		P		3		3
Chungking	C		8,000				
Hsin Chiaco	C		1				
Hsin Kai Shih	C		1				
Kiang Pei	C		1				
Kweyang	C		26				
Nei Kiang	C		200				
Pi Shan	C		40				
Yunnan Province	C		P				
India	C	75,859					
Bombay	C	37	9	6			
Calcutta	C	3,540	663				
Cawnpore	C	50	70				
Chittagong	C	15	2				
Delhi	C	11	46				
Madras	C	49					
Vizagapatam	C	13					
Indochina: Cochinchina	C	P					

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January-May 1945	June 1945	July 1945—week ended— 7	14	21	28
AFRICA							
Algeria	C	[1] 12					
Basutoland	C	4					
Bechuanaland	C	7					
Belgian Congo	C	6	2	1		1	
British East Africa:							
Kenya	C	5	[2] 6			13	
Uganda	C	4	2				
Egypt	C	113	59				
Ismailiya	C	72				5	2
Port Said	C	20	33	3		3	6
Suez	C	10	6	1	2		
French West Africa	C	5					
Dakar	C	1					
Madagascar	C	110	2				
Morocco (French)	C	231	270			[3] 101	
Senegal	C	54					
Tunisia	C	3					
Union of South Africa	C	7					
ASIA							
China:							
Foochow	C		P				
Yunnan Province [4]	C			P			
India	C	17,662					
Iraq	C	34					
Palestine	C	12					1
Plague-infected rats		17					
EUROPE							
France: Corsica—Ajaccio	C	2	4		2		
Great Britain: Malta	C		4		[5] 8	[5] 4	2
Portugal: Azores	C	3	2	1	2		
Spain: Canary Islands	C	1					
NORTH AMERICA							
Canada: Alberta Province: [6]							
Plague-infected squirrels			1	1			
SOUTH AMERICA							
Argentina:							
Buenos Aires Province—Plague-infected rats		2					
Santiago del Estero Province	C	1					
Bolivia: Santa Cruz Department	C	[7] 75					
Ecuador:							
Chimborazo Province	C	6					
Loja Province	C	2					
Peru:							
Ancash Department	C	1					
Ica Department	C	[8] 3					
Lambayeque Department	C	12					
Libertad Department	C	10					
Lima Department	C	10					
Otuzco Department	C	3					
Piura Department	C	4					
OCEANIA							
Hawaii Territory	D		[9] 1				
Plague-infected rats [7]		9					

[1] Includes 4 cases of pneumonic plague.
[2] Includes 5 suspected cases.
[3] For the period July 1–20, 1945.
[4] Information dated July 5, 1945, stated that from April 1944 to May 1945, 85 deaths from plague had occurred in the mountainous region south of Kunming, China.
[5] Includes 2 suspected cases.
[6] During the month of June 1945, plague infection in fleas was reported in Alberta Province. For the week ended July 28, 1945, plague infection was also reported in 6 pools of fleas in Alberta Province, Canada.
[7] Includes 6 suspected cases.
[8] Includes 1 suspected case.
[9] Previously reported as a case, death occurring on June 2, 1945.

SMALLPOX

[C indicates cases; P, present]

Place		January-May 1945	June 1945	July 1945—week ended— 7	14	21	28
AFRICA							
Algeria	C	135	18				
Angola	C	54					
Basutoland	C	306					
Belgian Congo	C	3,905	882				
British East Africa:							
Kenya	C	134	20			10	
Nyasaland	C	9					
Tanganyika	C	2,724	129	71			
Uganda	C	560	109	11			
Cameron (French)	C	318	16			[1] 40	
Dahomey	C	100	3			[1] 2	
Egypt	C	929	79				
French Equatorial Africa	C	1,515	11			5	
French Guinea	C	1,339	84			[1] 52	
French West Africa: Dakar District	C	365	19			[1] 6	
Gambia	C	69	12	1			
Gold Coast	C	26	3				
Ivory Coast	C	345	77			[1] 36	
Mauritania	C	74	6				
Morocco (French)	C	305	165			[1] 434	
Nigeria	C	3,116					
Niger Territory	C	401	45			[1] 11	
Rhodesia, Northern	C	609	147	4			
Senegal	C	421	26			[1] 36	
Sierra Leone	C	12					
Sudan (Anglo-Egyptian)	C	[2] 3					
Sudan (French)	C	1,371	251			[1] 195	
Togo (British)	C	25					
Togo (French)	C	418	39			[1] 25	
Tunisia	C		2				
Union of South Africa [3]	C	959	81	P		P	
ASIA							
Arabia	C	19	3				
Ceylon	C	[4] 348	31	9		19	9
China: [5] Kunming (Yunnan Fu)	C	7					
India	C	169,915					
Iran	C	351					
Iraq	C	21	15				
Syria and Lebanon	C	6					
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	1					
France	C	2	2	22			
Great Britain: Scotland	C	[2] 2					
Italy	C	1,540					
Sicily	C	4	1				
Portugal	C	16	3				
Spain	C	27					
Canary Islands	C	1					
Turkey	C	281	8				2
NORTH AMERICA							
Canada	C	6					
Guatemala	C	4					
Honduras	C	8					
Mexico	C	710					
Nicaragua	C	123					
SOUTH AMERICA							
Bolivia	C	293			200		
Brazil	C	[6] 59	[6] 25				
Columbia	C	161	50				
Ecuador	C	21					
Paraguay	C	1					
Peru	C	27					
Uruguay	C		19				
Venezuela	C	[6] 464	[6] 25			[6] 12	

[1] For the period July 1-20, 1945.
[2] Imported.
[3] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Union of South Africa.
[4] Includes some cases of chickenpox.
[5] For the months of March and April 1945, 688 cases of smallpox were reported in all of China.
[6] Includes cases of alastrim.

TYPHUS FEVER *

[C indicates cases; P, present]

Place		January–May 1945	June 1945	July 1945—week ended—			
				7	14	21	28
AFRICA							
Algeria	C	841	93				
Basutoland	C	50					
Belgian Congo [1]	C	109	22				
British East Africa: Kenya	C	24	3				
Egypt	C	13,004	1,535				
French West Africa: Dakar [1]	C	6	5				
Libya: Tripolitania	C	17					
Morocco (French)	C	4,154	935			[2] 829	
Nigeria	C		P				
Rhodesia, Northern	C	11					
Sierra Leone	C	1					
Tunisia	C	365	10			[2] 4	
Union of South Africa	C	459	P	P		P	
ASIA							
China: [3] Kunming (Yunnan Fu)	C	36	1				
India	C	21	1				
Iran	C	585					
Iraq	C	156	50	3	2	9	6
Palestine [1]	C	35	2				
Syria and Lebanon	C	12					
Trans-Jordan	C	42					
Turkey (see Turkey in Europe).							
EUROPE							
Albania	C	100					
Austria	C		30	16			
Belgium	C	106	37	2			
Bulgaria	C	928					
Denmark	C	114	30				
France	C	15	142		27		
Germany	C		7,579	185			
Gibraltar	C	4					
Great Britain	C	[4] 14	7				
Malta and Gozo [1]	C	9					
Greece	C	46	14				
Italy	C	98	20				
Netherlands	C	15	1				
Portugal	C	41	2				
Rumania	C	[5] 7,831					
Slovakia	C	230	25				
Spain	C	13					
Sweden	C	192					
Turkey	C	1,978	225	16	42	20	24
Yugoslavia	C	1,194					
NORTH AMERICA							
Canada [1]	C	1					
Costa Rica	C	3	2		1		
Cuba [1]	C	2	1				
Guatemala	C	802					
Jamaica	C	16	5				
Mexico	C	703					
Panama (Republic)	C	1	2				
Puerto Rico [1]	C	49	21	13	15	5	9
Virgin Islands [1]	C	8					
SOUTH AMERICA							
Bolivia	C	293					
Brazil	C	1					
Chile [1]	C	257	47				
Colombia	C	20					
Curacao	C	1					
Ecuador	C	195	34				
Peru	C	232					
Venezuela [1]	C	58	17				
OCEANIA							
Australia [1]	C	[6] 53	18				
Hawaii Territory [1]	C	39	13	1	1	1	3

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reports cases as murine type.

[2] For the period July 1–20, 1945.

[3] For the months of March and April, 1945, 861 cases of typhus fever were reported in all of China.

[4] Includes imported cases. [5] For the period Jan. 1–20, 1945. [6] Revised figures.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-May 1945	June 1945	July 1945—week ended—			
				7	14	21	28
AFRICA							
Gold Coast:							
Nsawam	C		2[1]		[2] 1		
Takoradi	C		1				
Winneba	C		1				
Ivory coast:							
Gaoua	C		1				
Guiglo	C	1					
Sierra Leone: Moyamba	C		2				
SOUTH AMERICA							
Brazil:							
Goiaz State	D	76					
Minas Geraes State	D	25					
Colombia: Santander del Norte Department	D	7					
Peru:							
Cuzco Department	C	2					
Loreto Department	C	1					
Venezuela:							
Bolivar State	C	1					
Merida State	C					2	
Tachira State	D	2	12		6		
Zulia State	C				3	1	2

[1] Includes 1 suspected case.
[2] Suspected.

* * *

THE TOXICOLOGY OF BERYLLIUM[1]

A Review

This investigation was undertaken because of the conflicting opinions relating to the toxicity of beryllium and because of the rapidly growing importance of this metal in industry. A study was made of the effects produced by the administration of beryllium compounds by mouth, by intraperitoneal injection and by inhalation. Beryllium oxide, carbonate, phosphate, chloride, sulfate, nitrate, oxyfluoride, hydroxide, potassium beryllium sulfate, and the mineral beryl (beryllium aluminum silicate) were chosen for experimental investigation. Guinea pigs, white rats, white mice, rabbits, and dogs were used as experimental animals. Symptoms of poisoning were sought; morbidity and mortality figures were collected; blood changes were studied; distribution of beryllium in the tissues following the various modes of exposure were determined; the irritant effect of certain beryllium salts on the skin was observed and the pathological changes resulting from exposure of animals to the various beryllium compounds were investigated. Comparison was made of the toxicities of beryllium, magnesium and zinc sulfates on intraperitoneal injection into mice.

[1] The toxicology of beryllium. By Frances Hyslop, Edward D. Palmes, William C. Alford, A. Ralph Monaco, and Lawrence T. Fairhall. National Institute of Health Bulletin No. 181. Government Printing Office, 1943. For sale by the Superintendent of Documents, Washington 25, D. C. Price 15 cents.

In addition to the exposure of animals to the dust of various beryllium compounds, animals were exposed to the fumes produced during the electrolytic deposition of beryllium at high temperatures.

No particular toxicity for beryllium was established as a result of this study. Animals tolerated large concentrations of various beryllium compounds over long periods of time with no indication of toxicity. No evidence of blood dyscrasia was apparent nor any consistent pathological change that could be attributed to beryllium. On the other hand certain beryllium salts which hydrolyse extensively, such as the sulfate and fluoride, were found to be irritant both to the skin and on inhalation.

THE TRIATOMINAE OF NORTH AND CENTRAL AMERICA AND THE WEST INDIES AND THEIR PUBLIC HEALTH SIGNIFICANCE [1]

A Review

A detailed account of the biology, systematics, and disease relationships of members of the Reduviid subfamily Triatominae from the area indicated. Life histories are given of seven North American species and a complete summary is given of host records.

The higher classification of the subfamily is revised with a new arrangement into 4 tribes. The tribe Triatomini is further subdivided into 12 species groups. These groups comprise closely allied species or subspecies. The principal subspecies complexes are *sanguisuga, lecticularius, rubida, protracta,* and *phyllosoma.* The various elements in each of these polytypic species show geographical replacement and are differentiated by relatively minor characters.

Keys are given to some eggs and nymphs and to adults of all of the known species. Each species is described, illustrated, and a summary is given of its distribution. Complete synonymy is included for each species. Four new tribes, one new genus, one new species, and five new subspecies are proposed.

A brief summary of the latest information on Chagas' disease is included, together with a discussion of the relation of triatomine bugs to the disease. Information on the infection rates in vectors and in animal reservoirs is summarized in two tables. Considering the relatively high rate of infection in vectors and in animal reservoirs in the southwestern United States it is considered likely that human cases actually have occurred but that the Mexican border population failed to recognize or report them.

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[1] The Triatominae of North and Central America and the West Indies and their public health significance. By Robert L. Usinger. Pub. Health Bull. No. 288. Government Printing Office, 1944. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25 cents.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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X C. FURTHER CULTURAL OBSERVATIONS ON THE RELATIVE EFFICACY OF SULFONAMIDES IN *SHIGELLA* INFECTIONS

By ALBERT V. HARDY, *Surgeon, (R) United States Public Health Service*

Observations on 501 individuals treated for shigellosis in New York State institutions in 1942 have been reported *(1)*. Two absorbed and two poorly absorbed sulfonamides were used in that study. During the following 18 months, 1,423 [3] additional infected individuals were studied similarly. In this study 10 sulfonamides, some in varying dosages, were tested.

The methods previously described were continued. Cases of acute diarrhea were reported and cultured promptly; carriers were discovered by cultural surveys. Fecal specimens were obtained by rectal swabs, and plates of S. S. (*Shigella-Salmonella*) agar were inoculated directly. There was ordinarily one pretreatment culture in cases and two or more in carriers. Those receiving medication were cultured daily except when treatment was given "prophylactically" to all in a group. Post-treatment cultures were obtained; in some groups these were taken repeatedly throughout a prolonged period. The number of suspicious colonies per petri plate was determined and recorded. At least one isolation from each individual was studied both culturally and serologically. In cases showing successive positive tests on the same individual, the cultures with a "positive" reaction on Kligler's tubes were usually identified by serological tests only.

Medication was dispensed in individual envelopes or boxes bearing the patient's name and directions as to dosage. The preparations used in a particular outbreak were given in rotation insofar as practicable. The amount of the respective sulfonamides administered daily, as shown in the tables, was divided into four equal doses, usually given at 7 a. m., 12 noon, 5 p. m., and 10 p. m., with variations to adjust to the daily schedule of the institution. The initial dose was twice the maintenance dose. Children under 75 pounds

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[3] This total does not include 16 control cases shown in tables 5 and 6.

were given one-half of the stated amounts. There were no infants in this series.

Findings are given in six tables. These show the average colony counts and the percent of individuals with persisting positive cultures for Flexner, Schmitz, and Sonne varieties of infection, respectively.

TABLE 1.—*Average colony counts*[1] *per S. S. agar plate in Flexner infections before and during treatment with different sulfonamides*

Type of Flexner	Treatment		Number treated	Average colony count[1]											
	Sulfonamide used	Daily dosage (gm.)		Day treatment started	Day of treatment										
					1	2	3	4	5	6	7	8	9	10	11
W	Diazine	4	27	264	98	51	2	0	0	[2] 0	----	----	----	----	----
W	Pyrazine	4	28	238	71	6	6	1	0	0	0	----	----	----	----
W	Merazine	4	21	369	118	6	1	.3	0	0	0	----	----	----	----
W	Methazine	4	20	320	151	32	15	1	0	0	0	----	----	----	----
W	Diazine	2	15	608	220	98	4	0	0	0	----	----	----	----	----
W	Pyrazine	2	12	233	114	12	.2	0	0	0	----	----	----	----	----
W	Merazine	2	13	373	126	17	0	0	0	----	----	----	----	----	----
W	Methazine	2	10	430	195	36	23	0	0	0	----	----	----	----	----
W	Diazine	2	28	319	----	4	----	1	----	----	0	----	0	----	----
W	Thiazole	2	7	325	----	----	0	----	0	----	----	----	0	----	----
W	Pyrazine	1	45	243	----	12	----	0	----	0	----	0	----	----	----
W	Diazine	(3)	25	304	88	2	.5	0	0	0	----	----	----	----	----
W	Diazine	(4)	21	251	101	2	5	2	3	0	0	0	----	----	----
Z	Diazine	(3)	50	265	81	51	1	0	0	.3	0	0	0	----	----
Z	Diazine [5]	(3)	15	245	6	10	.4	.3	0	0	0	0	.3	1	0
Z	Diazine	(3)	30	215	60	.4	1.6	0	.1	.6	.8	27.6	[6] 22.1	----	----
Newcastle	Diazine	(4)	15	329	----	5	----	0	----	0	----	0	----	----	----

[1] Suspicious colorless colonies of which the picked representative proved to be *Shigella*. The averages are computed on the basis of all individuals in the respective series. Plates having more than 1,000 colonies were recorded as 1,000.
[2] Follow-up cultures were also taken from 7 to 14 days following the third consecutive negative test.
[3] Total dosage 4 gm. in 3 days (first dose 2 gm. and then 1 dose of 1 gm. for 2 days).
[4] 1 dose only of 2 gm.
[5] Enteric coated (Lederle).
[6] Retreatment of positive cases started.

TABLE 2.—*Percentage of individuals with persisting positive cultures in Flexner infections treated with different sulfonamides*

Type of Flexner	Treatment		Number treated	Percentage with persisting positive cultures by day of treatment											
	Sulfonamide used	Daily dosage (gm.)		0	1	2	3	4	5	6	7	8	9	10	11
W	Diazine	4	27	100	63	30	11	0	0	0	----	----	----	----	----
W	Pyrazine	4	28	100	64.3	17.6	10.7	7.1	0	0	0	----	----	----	----
W	Merazine	4	21	100	66.6	28.6	23.8	9.5	0	0	0	----	----	----	----
W	Methazine	4	20	100	65.0	40.0	20.0	5.0	0	0	0	----	----	----	----
W	Diazine	2	15	100	86.7	53.4	26.7	0	0	0	----	----	----	----	----
W	Pyrazine	2	12	100	75.0	58.3	8.3	0	0	0	----	----	----	----	----
W	Merazine	2	13	100	61.5	30.8	0	0	0	----	----	----	----	----	----
W	Methazine	2	10	100	90.0	60.0	30.0	0	0	0	----	----	----	----	----
W	Diazine	2	28	100	----	21.3	----	3.6	0	----	0	----	0	0	----
W	Thiazole	2	7	100	----	----	0	----	0	----	----	----	0	0	----
W	Pyrazine	1	45	100	----	26.7	----	0	0	0	----	0	----	----	----
W	Diazine	(3)	25	100	44.0	4	4	0	0	0	----	----	----	----	----
W	Diazine	(4)	21	100	38.1	14.3	4.8	4.8	4.8	0	0	0	----	----	----
Z	Diazine	(3)	50	100	48	28.0	10.0	4.0	4.0	4.0	0	0	0	0	----
Z	Diazine [5]	(3)	15	100	46.7	26.7	13.3	13.3	6.7	6.7	6.7	6.7	6.7	6.7	0
Z	Diazine	(3)	30	100	56.7	43.3	26.7	20.0	16.7	16.7	13.3	10.0	[6] 10.0	----	----
Newcastle	Diazine	(4)	15	100	----	33.0	----	0	----	0	----	0	----	----	----

See table 1 for footnotes.

There were 382 Flexner cases or carriers of the W, Z, and Newcastle types of organisms. Absorbed sulfonamides only were used. All were highly effective. The last positive cultures were obtained on the fourth day of treatment except in cases given reduced dosage. Even here, from the third day of treatment few organisms were being excreted.

There were 2 Schmitz outbreaks in which 206 and 40 cases respectively were treated. These pathogens disappeared from the stools a little more slowly than the Flexner organisms. There was a relatively poor response to sulfathiazole, sulfaguanidine, and to small doses of sulfathaladine.

TABLE 3.—*Average colony counts [1] per S. S. agar plate in Schmitz infections before and during treatment with different sulfonamides*

Treatment		Number treated	Average colony counts [1]										
			Day treatment started	Day of treatment									
Sulfonamide used	Daily dosage (gm.)			1	2	3	4	5	6	7	8	9	10
Diazine	4	24	585	151	140	10	0.7	0.3	0	0.1	0	0	[2] 0
Pyrazine	4	28	463	149	53	.7	.6	3	0	0	0	-----	-----
Merazine	4	29	231	34	70	47	14	.1	.4	0	0	0	-----
Methazine	4	24	425	202	103	2	0	.1	0	0	0	-----	-----
Thiazole	4	31	425	240	112	76	45	41	.4	.3	0	.1	0
Guanidine	20	29	340	134	131	58	44	40	17	0	0	0	-----
Suxidine	20	17	380	108	39	15	1	0	-----	0	-----	-----	-----
Thaladine	10	24	411	196	101	22	13	.3	0	0	0	-----	-----
Thaladine	1	40	521	-----	-----	13	-----	15	-----	26	-----	-----	.7

See table 1 for footnotes.

TABLE 4.—*Percentage of individuals with persisting positive cultures in Schmitz infections treated with different sulfonamides*

Treatment		Number treated	Percentage with persisting positive cultures by day of treatment										
Sulfonamide used	Daily dosage (gm.)		0	1	2	3	4	5	6	7	8	9	10
Diazine	4	24	100	83.3	66.7	33.3	16.7	12.5	4.1	4.1	0	0	[2] 0
Pyrazine	4	28	100	78.6	39.3	14.3	14.3	7.1	0	0	0	-----	-----
Merazine	4	29	100	75.9	51.7	27.6	17.2	13.8	3.4	0	0	0	-----
Methazine	4	24	100	66.7	50.0	29.2	8.3	8.3	0	0	0	-----	-----
Thiazole	4	31	100	77.4	64.5	41.9	29.0	22.6	12.9	12.9	3.2	3.2	0
Guanidine	20	29	100	79.3	48.3	24.1	17.2	13.8	6.9	0	0	0	-----
Suxidine	20	17	100	82.3	64.7	29.4	11.8	0	0	0	-----	-----	-----
Thaladine	10	24	100	95.8	66.7	25.0	12.5	4.1	0	0	0	-----	-----
Thaladine	1	40	100	-----	-----	37.5	-----	30.0	-----	20.0	-----	-----	10.0

See table 1 for footnotes.

The Sonne variety of infection was the most widely prevalent in 1943. In all, 795 cases or carriers were treated, of which 621 were in one outbreak. This epidemic was caused by a strain of organism which was unusually resistant to sulfonamides. In this outbreak, 19 percent were still positive after 7 days of treatment; all but 2.5 percent of the other Sonne infections were negative at this time. Even the latter responded slowly as compared with Flexner and Schmitz infections. The complete clearing of Sonne infection in all individ-

uals given sulfasuxidine contrasted with the failure of all other sulfonamides in a small proportion of these cases and carriers.

TABLE 5.—*Average colony counts* [1] *per S. S. agar plate in Sonne infections before and during treatment with different sulfonamides*

Outbreak	Treatment: Sulfonamide used	Treatment: Daily dosage (gm.)	Number treated	Average colony counts: Day treatment started	Day of treatment: 1	2	3	4	5	6	7	8	9	10	11
1	Control	0	16	621	600	508	495	296	212	223	123	200	(*)	(*)	(*)
1	Diazine	4	72	678	379	232	165	76	78	44	16	14	14	.6	.5
1	Pyrazine	4	51	740	428	272	164	53	77	26	39	21	13	2	1
1	Merazine	4	48	549	388	240	159	138	42	40	10	2	2	2	2
1	Methazine	4	50	708	503	241	188	158	104	49	31	1	18	.6	10
1	Thiazole	4	48	732	616	346	278	130	20	14	18	26	3	1	(*)
1	Pyridine	4	19	562	522	170	226	155	85	77	30	3	1	26	(*)
1	Sulfanilamide	4	14	604	463	461	69	214	184	3	27	15	(*)	(*)	(*)
1	Guanidine	20	16	777	619	532	143	141	120	125	57	5	31	38	31
1	Suxidine	20	72	580	431	210	108	44	31	3	.2	0	0	[2] 0	----
1	Thaladine	10	53	536	359	193	228	162	125	30	11	14	.3	5	11
1	Diazine [5]	4	34	346	189	111	91	35	35	59	76	33	59	0	11
1	Pyrazine	6	29	476	447	149	157	12	38	44	5	17	.4	0	5
1	Diazine	1	21	550	----	308	----	----	156	----	----	72	----	----	.3
1	Pyrazine	1	14	651	----	----	147	----	----	96	----	----	.6	----	----
1	Guanidine	2	40	688	----	137	----	----	67	----	----	4	----	----	6
1	Suxidine	2	16	766	----	----	177	----	----	61	----	----	31	----	----
1	Thaladine	2	24	607	----	171	----	----	179	----	----	44	----	----	.3
2	Diazine	4	27	463	153	83	30	14	.6	1.6	.1	.1	0	0	0
2	Pyrazine	4	21	420	150	106	9	6	0	0	0	----	----	----	----
2	Merazine	4	13	638	331	141	123	4	2	0	0	0	----	----	----
2	Methazine	4	10	362	94	191	103	9	0	0	0	----	----	----	----
3	Pyrazine	4	9	911	572	201	59	3	3	0	0	0	----	----	----
3	Pyrazine	2	35	740	499	388	207	120	60	54	.4	0	0	.5	0
3	Thaladine	2	20	821	479	----	224	----	----	18	----	4	----	0	----
4	Diazine	4	39	228	126	9	15	4	2	0	0	3	0	0	0

*Sulfonamide changed.

See table 1 for footnote.

Variations in the response to different dosages of sulfonamides were studied in Flexner and Sonne infections. It was first found that the former cleared as readily with 2 gm. as with 4 gm. of absorbed sulfonamide daily. Sulfapyrazine, 1 gm. daily, was then used in another group and was effective. Recently, the total amount of sulfonamide per individual was reduced, first to 4 gm. (2 gm. as the initial dose and 1 gm. on each of the following 2 days) and then to 2 gm. in one dose only. There was some delay in the clearing of the infection with these smaller amounts of sulfonamide, but a high proportion of infected individuals became and remained culturally negative. The organisms concerned were highly sensitive to sulfonamides in vitro. In Sonne infections, by contrast, a reduction of dosage reduced the efficacy of treatment. In the series in outbreak No. 3 (tables 5 and 6) cases and carriers receiving 2 gm. daily of sulfapyrazine remained positive approximately twice as long as the corresponding cases given 4 gm. daily.

Organisms isolated after 7 or more days of treatment, if tested in vitro, were commonly found to be highly resistant to sulfonamides. The problem of treating Sonne infections appeared to be related in

part to the ready development of sulfonamide resistance by these organisms.

TABLE 6.—*Percentage of individuals with persisting positive cultures in Sonne infections treated with different sulfonamides*

Outbreak	Treatment		Number treated	Percentage with persisting positive cultures by day of treatment											
	Sulfonamide used	Daily dosage (gm.)		0	1	2	3	4	5	6	7	8	9	10	11
1	Control	0	16	100	93.7	87.5	81 3	62.5	62.5	62.5	62.5	62.5	(*)	(*)	(*)
1	Diazine	4	72	100	93.0	86.1	66.7	63.9	50.0	33.3	22.2	11.1	6.9	5.5	1.4
1	Pyrazine	4	51	100	90.2	80.4	56.9	51.0	41.2	21.6	11.7	9.8	5.9	3.9	3.9
1	Merazine	4	48	100	93.7	72.9	60.4	47.9	31.2	25.0	14.6	10.4	8.3	2.1	1.0
1	Methazine	4	50	100	92.0	82.0	62.0	54.0	30.0	22.0	12.0	10.0	6.0	4.0	4.0
1	Thiazole	4	48	100	89.6	83.3	77.1	70.8	56.2	47.9	39.6	20.8	12.5	4.2	(*)
1	Pyridine	4	19	100	89.5	78.9	73.7	57.9	47.4	47.4	42.1	26.3	5.3	5.3	(*)
1	Sulfanilamide	4	14	100	100.0	78.6	71.4	71.4	57.1	42.9	21.4	14.3	(*)	(*)	(*)
1	Guanidine	20	16	100	93.7	75.0	62.5	37.5	25.0	25.0	25.0	25.0	12.5	12.5	6.2
1	Suxidine	20	72	100	83.3	72.2	45.8	25.0	18.1	8.3	2.8	0	0	[2] 0	----
1	Thaladine	10	53	100	92.5	83.0	64.1	56.6	37.7	32.1	18.9	18.9	13.2	11.3	7.5
1	Diazine [5]	4	34	100	91.2	67.6	47.1	32.4	23.5	17.6	11.8	5.9	5.9	5.9	5.9
1	Pyrazine	6	29	100	86.2	72.4	65.5	48.2	41.3	31.0	24.1	17.2	10.3	6.9	3.4
1	Diazine	1	21	100	-----	71.4	-----	-----	47.6	-----	-----	23.8	-----	-----	4.8
1	Pyrazine	1	14	100	-----	-----	85.7	-----	-----	28.6	-----	-----	7.1	-----	----
1	Guanidine	2	40	100	-----	72.5	-----	-----	47.5	-----	-----	20.0	-----	-----	7.5
1	Suxidine	2	16	100	-----	-----	75.0	-----	-----	43.8	-----	-----	6.2	-----	----
1	Thaladine	2	24	100	-----	79.2	-----	-----	62.5	-----	-----	25.0	-----	-----	4.2
2	Diazine	4	27	100	92.6	70.4	55.6	33.3	14.8	11.1	7.4	3.7	0	0	0
2	Pyrazine	4	21	100	76.2	33.3	23.8	14.3	0	0	0	-----	-----	-----	----
2	Merazine	4	13	100	84.6	53.8	30.8	15.4	7.7	0	0	0	-----	-----	----
2	Methazine	4	10	100	70.0	40.0	30.0	30.0	0	0	0	-----	-----	-----	----
3	Pyrazine	4	9	100	100.0	88.9	66.7	33.3	11.1	11.1	0	0	0	-----	----
3	Pyrazine	2	35	100	94.3	85.7	80.0	57.1	60.0	40.0	17.1	2.9	2.9	2.9	0
3	Thaladine	2	20	100	80.0	-----	45.0	-----	-----	20.0	-----	10.0	-----	0	----
4	Diazine	4	39	100	69.2	46.2	35.9	25.6	12.8	2.6	2.6	2.6	0	0	0

*Sulfonamide changed.

See table 1 for footnotes.

Following treatment for Flexner infection with 2 or 4 gm. of absorbed sulfonamide daily, 113 individuals were held in isolation and examined culturally an average of 11.3 times per person during a period of 2 months. There was no recurrence of infection. Three of 30 who received a total of only 4 gm. of sulfadiazine did have a return of positive cultures after 3 or more consecutive negative tests. Other individuals were followed for varying periods. Positive cultures were discovered occasionally, particularly when the individual, after treatment, was returned to a group in which the infection was spreading actively.

The variation in the bacteriostatic activity of the different sulfonamides in *Shigellae* infections in vivo is summarized in table 7. Here the numbers of organisms in the lower enteric tract as determined by colony counts on the day treatment started are compared with the total of all daily counts during treatment. In the Flexner cases it was found that fewer organisms were discharged during the course of treatment than on the one day on which treatment was started. The Schmitz infection cleared a little more slowly. Sonne infections varied by outbreaks but were more resistant. Considering all infections, three sulfonamides—sulfadiazine, sulfapyrazine and sulfasuxi-

dine—have superior records. Sulfamerazine and sulfamethazine were a little less effective, although the former appeared highly active in Flexner infections. Sulfathiazole and sulfaguanidine were the least satisfactory of the seven drugs that were widely tested. Sulfathaladine in the series in which it was employed was less active than sulfasuxidine, a chemically related compound. Sulfapyridine and sulfanilamide were the least potent sulfonamides in the treatment of *Shigella* infections.

TABLE 7.—*The relative bacteriostatic activity of various sulfonamides as indicated by the ratio*[1] *of the total of all daily colony counts during treatment to the counts on the day treatment was started*

Variety of *Shigella*	Year and outbreak	Daily dosage of sulfonamide (gm.)[2]	Ratio of all daily colony counts during treatment to the counts on the day the respective sulfonamide was started										
			Diazine	Pyrazine	Morazine	Methazine	Thiazole	Pyridine	Sulfanilamide	Guanidine	Suxidine	Thaladine	Control
Flexner[3]	[4] 1942	3 or 4	0.20	------	------	------	0.84	------	------	0.63	0.84	------	------
	1943	4	.57	.35	.34	.62	------	------	------	------	------	------	------
	1943	2	.50	.53	.38	.59	------	------	------	------	------	------	------
	1943	[5] 2 or 4	.39	------	------	------	------	------	------	------	------	------	------
Schmitz	[4] 1942	3 or 4	------	------	------	------	------	------	------	.72	.49	------	[6] 3.0
	1943	4	.52	.44	.71	.72	1.20	------	------	1.24	.48	.78	------
Sonne	[4] 1942	3 or 4	.80	------	------	------	1.00	------	------	1.21	.83	------	[6] 5.6
	1943-1	4	1.59	1.48	1.86	1.84	1.98	2.30	2.38	2.37	1.43	2.12	[7] 4.3
	1943-2	4	.61	.64	.94	1.10	------	------	------	------	------	------	------
	1943-3	4	------	.92	------	------	------	------	------	------	------	------	------
	1943-4	2	------	1.80	------	------	------	------	------	------	------	------	------
	1943-5	4	.54	------	------	------	------	------	------	------	------	------	------

[1] It is assumed that the excretion of organisms and the weight of infection are measured relatively by the daily colony counts. With a pretreatment average colony count of 400 and successive average daily colony counts during treatment of 240, 50, 9, 1, and 0 (total 300), the ratio would equal $\frac{300}{400}$ or 0.75.

[2] Dosage of absorbed sulfonamides for adults. Five times as much sulfaguanidine and sulfasuxidine and 2.5 times as much sulfathaladine was given.

[3] The findings on all types of Flexner are combined since there was no evident variation in the response to sulfonamides.

[4] Previously reported data (*1*).

[5] Total dosage.

[6] Measured for 5 days.

[7] Measured for 8 days.

The responses of seven Shiga strains were tested in vitro. These strains were less sensitive than Flexner, more sensitive than Sonne, and approximately equal in sensitiveness to the Schmitz variety.

Considering toxicity, availability, and relative efficacy, it is concluded that at present sulfadiazine is the drug to be recommended for *Shigella* infections. Sulfasuxidine is an alternative poorly absorbed compound which may be used in cases which do not respond readily to sulfadiazine. Sulfapyrazine, sulfamerazine, or sulfamethazine may be used if preferred. The other sulfonamides are to be recommended for shigellosis only when the more effective preparations are not available.

REFERENCES

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SICKNESS ABSENTEEISM AMONG MALE AND FEMALE INDUSTRIAL WORKERS DURING 1944, AND AMONG MALES DURING THE FIRST QUARTER OF 1945, WITH A NOTE ON ABSENCE DURATION, 1941–44 [1]

By W. M. Gafafer, *Principal Statistician, United States Public Health Service*

The quarterly reports for the year 1944 on the frequency of sickness and nonindustrial injuries disabling for more than 1 week among a group of approximately 250,000 male members of industrial sick benefit organizations have appeared (*1–3*), the organizations including sick benefit associations, group insurance plans, and company relief departments. The present report is concerned with the experience of male and female workers during 1944 and earlier years, and of males during the first quarter of 1945 and corresponding earlier quarters. Particular attention is directed to time changes in certain annual frequency rates covering the decade 1935–44, and to changes in absence duration among the 4 years, 1941–44. The last report on the experience among females appeared in 1944 (*1*).

YEAR 1944

The male and female frequency rates for 1944, 1943, and the decade 1935–44 are shown by cause in table 1. The corresponding rates for the single years 1935–42 appear in reference *4*.

The 1944 male rate for all causes (140.9 absences per 1,000 males) is the highest recorded annual rate of the 10 years 1935–44, being 37 percent above the 10-year mean (102.9), but only 2 percent above the corresponding rate for 1943 (138.1).

The 1944 female rate for all causes (221.0 absences per 1,000 females) is likewise the highest recorded annual rate of the 10-year period, being 35 percent above the mean of 163.1 but only 8 percent above the rate for 1943 (204.1).

In each of the past 10 years 1935–44, the female rate for all causes and each of the broad cause groups (with the possible exception of nonindustrial injuries) is higher than the corresponding male rate, the excess in the total frequency among females in 1944 being 57 percent.

[1] From the Industrial Hygiene Division, Bureau of State Services.

TABLE 1.—*Average annual number of absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by sex and cause, experience of MALE and FEMALE employees in various industries, 1944, 1943, and 1935–44, inclusive* [1]

Cause. (Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939)	Annual number of absences per 1,000 persons					
	Males			Females		
	1944	1935–44 [2]	1943	1944	1935–44 [2]	1943
Sickness and nonindustrial injuries	140.9	102.9	138.1	221.0	163.1	204.1
Percent of female rate	*64*	*63*	*68*			
Percent of male rate				*157*	*159*	*148*
Nonindustrial injuries (169–195)	12.1	11.5	11.9	14.5	13.1	11.3
Sickness	128.8	91.4	126.2	206.5	150.0	192.8
Respiratory diseases	57.6	40.8	66.6	85.5	66.5	100.1
Tuberculosis of respiratory system (13)	.7	.8	.8	.2	.6	.6
Influenza, grippe (33)	24.6	18.2	29.7	28.4	27.7	43.9
Bronchitis, acute and chronic (106)	9.7	5.9	10.4	11.2	8.2	10.8
Pneumonia, all forms (107–109)	6.3	4.1	8.8	2.2	2.0	4.2
Diseases of pharynx and tonsils (115b, 115c)	6.1	5.8	6.7	17.2	13.2	14.5
Other respiratory diseases (104, 105, 110–114)	10.2	6.5	10.2	26.3	14.8	26.1
Digestive diseases	19.7	15.0	17.5	36.0	25.3	29.0
Diseases of stomach except cancer (117, 118)	6.5	4.4	5.9	3.8	2.6	2.8
Diarrhea and enteritis (120)	2.8	1.5	2.1	6.1	3.0	3.8
Appendicitis (121)	4.7	4.5	4.6	16.9	13.3	16.4
Hernia (122a)	2.1	1.7	2.0	.8	.4	.2
Other digestive diseases (115a, 115d, 116, 122b–129)	3.6	2.9	2.9	8.4	6.0	5.8
Nonrespiratory-nondigestive diseases	46.1	32.7	37.7	79.6	53.6	59.0
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [3]	2.4	2.4	2.4	4.6	3.9	5.2
Cancer, all sites (45–55)	.5	.5	.4	.2	.4	.4
Rheumatism, acute and chronic (58, 59)	6.1	4.2	4.5	5.2	3.3	2.9
Neurasthenia and the like (part of 84d)	2.4	1.3	1.6	14.0	7.4	9.7
Neuralgia, neuritis, sciatica (87b)	3.2	2.3	2.7	3.3	2.3	1.8
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	2.0	1.3	1.5	1.4	1.0	.9
Diseases of heart (90–95)	4.6	2.9	3.2	2.5	1.6	1.7
Diseases of arteries and high blood pressure (96–99, 102)	2.4	1.2	1.6	1.4	.8	.8
Other diseases of circulatory system (100, 101, 103)	4.2	2.7	3.7	5.5	3.1	3.4
Nephritis, acute and chronic (130–132)	.5	.4	.5	.5	.4	.3
Other diseases of genitourinary system (133–139)	3.6	2.6	2.7	15.2	10.8	12.6
Diseases of skin (151–153)	3.6	3.0	3.2	5.2	3.7	4.5
Diseases of organs of movement except diseases of joints (156b)	3.8	3.0	3.5	5.1	2.6	3.7
All other diseases (56, 57, 60–79, 88, 89, 154, 155, 156a, 157, 162)	6.8	4.9	6.2	15.5	12.3	11.1
Ill-defined and unknown causes (200)	5.4	2.9	4.4	5.4	4.6	4.7
Average number of person-years	267,716	2,220,177	293,960	29,750	189,127	28,519

[1] Industrial injuries and venereal diseases are not included.
[2] Average of the 10 annual rates.
[3] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

BROAD CAUSE GROUPS, 1935–44

The 10 annual rates for all causes and for each of the broad cause groups are shown graphically for males and females in figure 1.

Respiratory diseases.—For both males and females the frequency of respiratory diseases in 1944 was less than the respiratory rate for 1943, the 1943 frequencies reflecting the presence of the respiratory epidemic occurring principally in December of that year (*1*). Never-

theless, the male and female respiratory frequencies for 1944 are exceeded only by those for 1943, and are 41 and 29 percent, respectively, above the mean rates for the 10-year period.

Digestive diseases.—For each sex the 1944 frequency of digestive diseases has never been equalled or exceeded in the 10-year period, the excesses in the rates when compared with the 10-year means being 31 and 42 percent for males and females, respectively. Of particular interest among males is the relative stability of the rates during the years 1935–39, and the gradual increase in frequency during 1940–44.

Nonrespiratory-nondigestive diseases.—The nonrespiratory-nondigestive diseases also show for 1944 the highest rates of the 10 years 1935–44, yielding excesses of 41 percent for males and 49 percent for females when compared with the corresponding 10-year means.

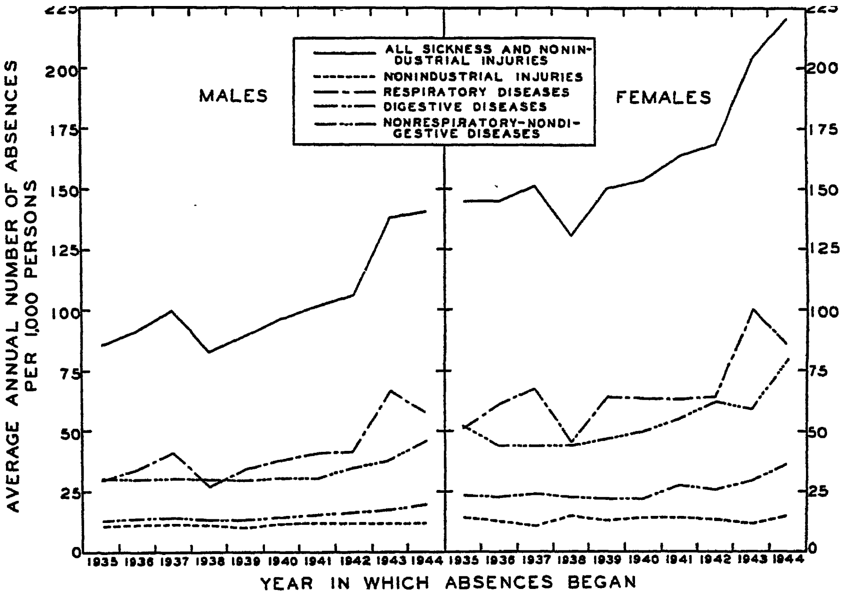

FIGURE 1.—Average annual number of absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by sex and broad cause group; variation of rates with time; experience of MALE and FEMALE employees in various industries, 1935–44, inclusive.

Among males the rates for the years 1935 through 1941 are relatively stable, the frequency increasing in the years 1942–44. Among females the trend of the rates since 1937 has been generally upward, the marked increase in 1944 nullifying the slight downward movement of the rate in 1943.

NONRESPIRATORY-NONDIGESTIVE CAUSES SHOWING RELATIVELY HIGH RATES IN 1944

The noteworthy excesses of more than 40 percent observed in the comparison of the 1944 male and female nonrespiratory-nondigestive

disease rates with the corresponding mean rates for 1935–44 raises the question of the specific causes primarily contributing to these excesses. It will be noted in table 1 that four groups of specific diagnoses are chiefly responsible, namely, rheumatic diseases, including rheumatism, acute and chronic, neuralgia, neuritis, and sciatica, and diseases of organs of movement except diseases of joints; neurasthenia, including nervous asthenia, nervous exhaustion, nervous fatigue, "nerves," etc.; diseases of the circulatory system, including diseases of the heart and arteries, high blood pressure, and "other diseases of the circulatory system"; and diseases of the genitourinary system, including nephritis, acute and chronic, and "other diseases of the genitourinary system."

The variation in the frequency of these four causes throughout the 10 years 1935–44 is presented graphically for males and females in

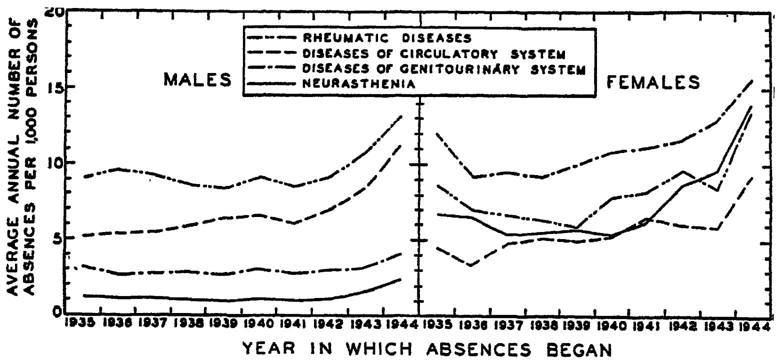

FIGURE 2.—Average annual number of absences per 1,000 persons on account of selected nonrespiratory-nondigestive causes disabling for 8 consecutive calendar days or longer, by sex; variation of rates with time; experience of MALE and FEMALE employees in various industries, 1935–44, inclusive.

figure 2. For each sex and cause the 1944 rate is the highest rate recorded for the 10 years, the percentage excesses over the corresponding 10-year means being for males and females, respectively, as follows: Rheumatic diseases, 38 and 66 percent; neurasthenia, 100 and 89 percent; diseases of the circulatory system, 65 and 68 percent; and diseases of the genitourinary system, 37 and 40 percent.

Noteworthy is the sex difference in the order of the frequencies shown in figure 2. Among males the highest rates are consistently revealed for the rheumatic diseases, with diseases of the circulatory system, diseases of the genitourinary system, and neurasthenia ranking second, third, and fourth in frequency each year. Among females, diseases of the genitourinary system regularly yielded the highest frequency rate each year while diseases of the circulatory system were generally low. Neurasthenia, ranking third in order in 1935–40, fell slightly below the circulatory diseases in 1941 but rose rapidly to second place in 1943 and 1944.

ABSENCE DURATION, 1941–44

Figure 3 presents graphically by sex, for the organizations reporting absences by duration, the frequency of ended absences on account of sickness and nonindustrial injuries disabling for a specified number of calendar days or longer. The absences began in the years 1941–44, and the minimum duration periods range from 8 through 92 days.

The rates for a particular year indicate the ability of absences beginning in that year to continue to contribute to the frequency rate as the lower limit of duration is increased. In general, the presence of a relatively large number of absences of long duration is reflected in a relatively slow decline in the curve for a particular year; on the other

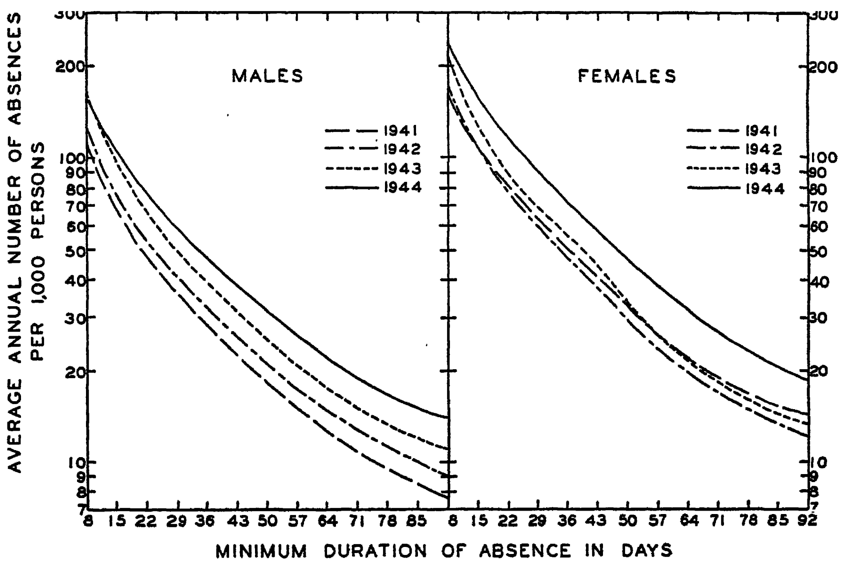

FIGURE 3.—Average annual number of ended absences per 1,000 persons on account of sickness and nonindustrial injuries disabling for the specified number of calendar days or longer, by sex; experience of MALE and FEMALE employees in various industries reporting absences by duration, absences beginning in 1941–44, inclusive. (Vertical logarithmic scale.)

hand, a relatively large number of short absences is reflected in a curve decreasing less slowly. Figure 3 is useful, therefore, in showing graphically any possible differences among the experiences yielded by the 4 years with respect to duration of disability.

Males, 1941–44.—For the group of organizations reporting absences by duration the frequency of all disabilities of 8 days or longer among males was slightly less in 1944 than in 1943. The occurrence of a relatively large number of 8–14-day absences in 1943, however, is evidenced by the fact that for absences of 15 days or longer, and with increasing minimum durations, the rates for 1944 are above the rates for 1943. Indeed with the exception of the initial points the rates for each of the indicated duration periods increase from 1941 through 1944.

An examination of figure 3 reveals that the rates for 1944 decrease less rapidly than the rates for any of the years 1941–43. In each of the first 3 years about 20 percent of all 8-day or longer absences due to disability lasted more than 6 weeks (43 days or longer); the corresponding percentage for 1944 is 24. Similarly 7 percent of the disabilities beginning in the first 3 years lasted more than 3 months (92 days or longer), the corresponding percentage for 1944 being 9. It would appear therefore that in comparison with the years 1941–43, the 1944 disability experience of males in companies reporting absences by duration is characterized by a relatively large proportion of absences of long duration.

Females, 1941–44.—Among females the 1944 rate for each of the indicated duration periods is consistently higher than the rates for the 3 earlier years. In general it will be observed in figure 3 that the rates for 1944 decrease less rapidly than the rates for either 1943 or 1942, but at approximately the same rate as the frequencies for 1941. In both 1944 and 1941 approximately one-fourth of the 8-day or longer disabilities lasted more than 6 weeks, while about 8 percent lasted more than 3 months.

TABLE 2.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause, experience of MALE employees in various industries, first quarter of 1945 compared with first quarters of 1944 and 1943*[1]

Cause. (Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939)	Annual number of absences per 1,000 males for the first quarter		
	1945	1944	1943
Sickness and nonindustrial injuries	168.2	171.8	164.9
Nonindustrial injuries (169–195)	16.0	12.1	12.8
Sickness	152.2	159.7	152.1
Respiratory diseases	73.0	94.2	97.7
Tuberculosis of respiratory system (13)	.7	.6	.5
Influenza, grippe (33)	26.6	52.8	40.9
Bronchitis, acute and chronic (106)	13.7	11.5	16.7
Pneumonia, all forms (107–109)	7.7	11.1	16.2
Diseases of pharynx and tonsils (115b, 115c)	7.2	6.5	10.0
Other respiratory diseases (104, 105, 110–114)	17.1	11.7	13.4
Digestive diseases	20.6	17.4	14.7
Diseases of stomach except cancer (117, 118)	7.5	5.9	4.7
Diarrhea and enteritis (120)	2.5	2.2	1.6
Appendicitis (121)	4.1	4.2	3.8
Hernia (122a)	2.5	1.7	2.0
Other digestive diseases (115a, 115d, 116, 122b–129)	4.0	3.4	2.6
Nonrespiratory-nondigestive diseases	52.7	42.2	36.1
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44)[2]	3.5	2.4	2.7
Rheumatism, acute and chronic (58, 59)	7.1	5.9	4.4
Neurasthenia and the like (part of 84d)	2.4	1.8	1.2
Neuralgia, neuritis, sciatica (87b)	4.1	3.0	3.0
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	2.4	1.6	1.5
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	8.9	7.6	5.2
Other diseases of genitourinary system (133–138)	3.4	3.4	2.5
Diseases of skin (151–153)	3.6	2.8	2.7
Diseases of organs of movement except diseases of joints (156b)	4.2	3.2	3.5
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	13.1	10.5	9.4
Ill-defined and unknown causes (200)	5.9	5.9	3.6
Average number of males	225,797	256,610	265,428

[1] Industrial injuries and venereal diseases are not included.
[2] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

MALES, FIRST QUARTER, 1945

The morbidity experience of males for the first quarter of 1945 as compared with the corresponding quarters of 1943 and 1944 is shown in table 2. Attention is directed to (1) the relatively stable rate for all sickness, (2) the nonindustrial injury rate of 16.0 which has never been equalled or exceeded during the past 10 years, (3) the substantial drop in the rate for the respiratory diseases reflecting principally the decrease in the rate for influenza and grippe, and (4) the continuous rise over the 3 years of the rate for the digestive diseases and the rate for the nonrespiratory-nondigestive diseases, both rates for 1945 having never been equalled or exceeded during the past 10 years.

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(*2*) ————: Sickness absenteeism among industrial workers, third quarter of 1944. Pub. Health Rep., **60**: 145–148 (Feb. 9, 1945.)
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ISOLATION OF *PASTEURELLA TULARENSIS* FROM SPUTUM

A Report of Successful Isolations From Three Cases Without Respiratory Symptoms

By CARL L. LARSON, *Passed Assistant Surgeon, United States Public Health Service*

Pasteurella tularensis may be isolated by inoculation of susceptible animals with certain materials obtained from patients suffering from tularemia. Blood, conjunctival scrapings, pus from the nose of a patient with oculoglandular tularemia, material from primary lesions of the skin, the lymph nodes, pleural fluid, ascitic fluid, fluid from the olecranon bursa, spinal fluid, bone marrow, and sputum from patients have produced infections when inoculated into animals from which pure cultures of the organism were subsequently obtained by cultivation of selected tissues on suitable media (*1*). Francis lists four cases in which the organism was isolated by this method from the sputum of individuals with pulmonary involvement. Isolation of *P. tularensis* from the sputum of such cases is not unexpected, for pulmonary lesions at autopsy are usually found to contain organisms. Johnson (*2*) cultured *P. tularensis* from mice which had been inoculated with the sputum of a person suffering from tularemia who had no evidence of pulmonary involvement. This is of great interest for it indicates that the presence of specific organisms in the respiratory tract of

individuals with tularemia is not necessarily associated with the presence of signs or symptoms referable to the respiratory system.

The studies to be reported are concerned with the isolation of *P. tularensis* from the sputum of three individuals with tularemia, none of whom manifested symptoms referable to involvement of the respiratory tract. One case had the typhoidal type and the others had the ulceroglandular type of tularemia.

METHODS

Sputum was collected from patients and transported to the laboratory as quickly as possible. The sputum was diluted with about nine times its volume of 0.85-percent salt solution and mixed by repeated aspiration into a 5-cc. syringe to which a 22-gage needle was attached. White Swiss mice, weighing about 15 gm., were inoculated intraperitoneally with 0.1 cc. to 0.5 cc. of sputum suspension and, in some instances, guinea pigs were inoculated subcutaneously with 0.5 cc. of suspension. No attempts were made to culture sputum on glucose cystine blood agar because of the obvious gross bacterial contamination of sputum specimens. Mice exhibited symptoms of acute infection in a few days and died within a week after intraperitoneal inoculation with infective sputum.

In some instances it was desired to establish an etiological diagnosis of tularemia before the mice were definitely ill. To accomplish this a mouse was killed and the liver and spleen removed aseptically. Portions of the liver and spleen were cultured on glucose cystine blood agar and 0.5 cc. of a 10-percent suspension of liver and spleen in 0.85 percent salt solution was inoculated intraperitoneally into a group of mice. Impression smears of the liver and spleen were made on glass slides and the smears stained with Wayson's stain. The presence of very small bacillary organisms, staining a deep purple and occurring both intracellularly and extracellularly was considered sufficient evidence to offer a tentative diagnosis based on etiological grounds. This evidence has been corroborated in each case by subsequent isolation of *P. tularensis* from the animal studied or from the animals inoculated with the suspension prepared from its tissues.

Case 1.—M. J. In May 1944, three individuals were admitted to Children's Hospital, Washington, D. C., to the service of Dr. J. McLeod. All of the children had played with a sick wild rabbit several days before onset of illness. One of the children died and another developed the typhoidal type of tularemia with pulmonary involvement, the signs of which were elicited by physical examination and demonstrated by X-ray examination. The third child, a colored female, 10 years of age, became ill on May 11, 1944, with fever and sore throat and was admitted to hospital on May 13. She did not appear acutely ill. The throat was injected, the tonsils were red and enlarged, and the cervical lymph nodes palpable. On May 17, X-ray examination of the chest showed some fibrosis but no evidence of fluid or consolidation. Ten days later this condition had not changed. Specific

symptoms or signs suggestive of involvement of the respiratory tract were not manifested during the course of illness. The white blood cell count was 8,400 cells per cubic millimeter of blood on admission. On May 23, serum was obtained from this patient and tested for the presence of agglutinins against *P. tularensis.* A titre of 1:2,560 was demonstrated. Another sample of serum drawn 3 days later was examined at the National Institute of Health and agglutinins against *P. tularensis* were demonstrated in the same titre.

A sample of sputum was obtained on May 26. This was diluted and mixed with about nine times its volume of 0.85-percent salt solution, and 0.3 cc. of the diluted sputum was inoculated intraperitoneally into each of six mice. All the mice died within 3 days following inoculation. Lesions suggestive of tularemia were noted in the mice, microscopic examination of smears of spleen tissue stained with Wayson's stain revealed organisms characteristic of *P. tularensis,* and cultures on glucose cystine blood agar resulted in the isolation of *P. tularensis* from the tissues of these animals.

Case 2.—S. A., a white female, 45 years of age, was admitted to Providence Hospital, Washington, D. C., on the service of Dr. T. Collins, on August 13, 1944, with a history of fever of 2 days' duration, chills, back pains, and frequency of urination. She had been vacationing at an area where ticks and wild animals were abundant. On examination the temperature was 103.6° F. and the pulse rate 120. The only other finding consisted of a small ulcer at the tip of the first finger of the left hand. About 1 week before admission the patient had experienced a thorn prick in this spot. Subsequently, enlarged epitrochlear and axillary lymph nodes developed, and eventually the axillary lymph nodes suppurated and were incised. The temperature ranged between 105.2° F. and 98° F. for the first 2 weeks of hospitalization, and between 101.8° F. and 98.4° F. during the following 3 weeks. The white blood cell count ranged from 5,200 to 8,300 cells per cubic millimeter of blood. Symptoms or signs referable to pulmonary disease were not noted throughout the course of illness. An X-ray film of the chest revealed no abnormalities.

The patient was seen on August 29, when blood was obtained to be tested for the presence of agglutinins against *P. tularensis* and scrapings from the base and sides of the ulcer were harvested in 0.85 percent salt solution to be examined for the presence of this organism. The serum agglutinated *P. tularensis* to a titre of 1:2,560. The scrapings from the ulcer were thoroughly dispersed in salt solution and 0.5 cc. was injected subcutaneously into a guinea pig and 0.2 cc. intraperitoneally into each of five mice. *P. tularensis* was subsequently isolated from the guinea pig and from some of the mice.

Sputum was obtained from the patient on August 30, August 31, and on September 1. As each sample of sputum was obtained it was thoroughly mixed with about nine parts of salt solution and a guinea pig inoculated intraperitoneally with 0.5 cc. of diluted sputum, two mice intraperitoneally with 0.2 cc., and three mice intraperitoneally with 0.5 cc. of diluted sputum. *P. tularensis* was isolated from the guinea pig and from mice inoculated with each sample of sputum. Organisms morphologically identical with *P. tularensis* could be identified in the spleens of mice sick or dead as a result of inoculation of diluted sputum into the peritoneal cavity.

Case 3.—F. R., a white male, was admitted to the Veterans Administration Facility, Washington, D. C., on November 19, 1944. He had a history of fever, malaise, an ulcer on the fourth finger of the left hand which had been present for "several days," and an enlargement in the left axilla. On admission it was determined that he had handled dead rabbits about a week before coming to the hospital. The temperature was 38° C. on admission, and by November 24

reached 40° C. Following this there was gradual lysis of the temperature until December 4, when a normal temperature was reached and continued to be maintained during the balance of the hospital stay. An X-ray film exposed on November 23 showed no pulmonary lesions, but another X-ray study on November 29 showed "minimal bilateral pleural effusion with possibility of a slight degree of a pulmonary inflammatory process." Serum examined on November 25 had an agglutinin titre of 1:10 against *P. tularensis*. By December 7, an agglutinin titre of 1:1,280 against *P. tularensis* had developed.

The patient was seen on November 25, 1944, when scrapings from the local lesion and sputum were collected. Sputum specimens were again collected on November 29, December 3, December 10, and on December 14. The sputum specimens were diluted in saline as previously described and injected intraperitoneally into groups of six mice each. In every group two mice were given 0.1 cc., two were given 0.2 cc., and two 0.3 cc. None of the mice inoculated with specimens of sputum taken on December 10 and December 14 died or became ill. All of the mice inoculated with a suspension of scrapings and pus from the local lesion succumbed in 3 to 5 days and all mice inoculated with sputum collected on November 25, November 29, and December 3 died in 3 to 6 days; *P. tularensis* was isolated from these mice. Microscopic examination of smears of spleen tissue of these mice, stained with Wayson's stain, revealed organisms typical of *P. tularensis*.

DISCUSSION

From the data presented it appears that organisms may be present in the respiratory tract of patients suffering from typhoidal or ulceroglandular types of tularemia even though specific symptoms referable to this system are absent. The detection of pulmonary lesions by X-ray examination in case 3 was accomplished only because organisms had been previously isolated from the sputum and it was desired to detect any possible pulmonary lesions. No symptoms of respiratory involvement were manifested by the patient or detected by physical methods. In the other cases no pulmonary lesions were detected by X-ray examination.

The question of the possibility of a respiratory route of infection in tularemia is debatable. Johnson (*2*) considers it possible that respiratory transmission of tularemia may assume importance. Throughout the known history of tularemia there has been no well-established case in which the disease was contracted through person-to-person contact. That respiratory infection can occur is evidenced by the study of Ashburn and Miller (*3*) of a fatal case in a laboratory worker.

Inoculation of mice with suspensions of sputum from patients suspected of having tularemia and inoculation of glucose cystine blood agar with organs of the mice which become ill or die is recommended as a method of attempting to establish a diagnosis of tularemia. A tentative diagnosis may be established at an early period by studying smeared spleen preparations stained with Wayson's stain. The smears are made from the spleens of mice dead or ill following inoculation of

suspected material. An early tentative diagnosis is of value because therapy may be started 24 to 48 hours earlier than when the results of cultures are awaited.

CONCLUSIONS

P. tularensis was isolated from the sputum of three persons suffering from tularemia who manifested no frank clinical signs of pulmonary involvement.

The inoculation of mice with sputum suspensions from patients suspected of having tularemia is recommended as a laboratory procedure.

Microscopic examination of smeared preparations of infected mouse spleens, stained with Wayson's strain, offers a method of establishing an early tentative diagnosis of tularemia.

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DEATHS DURING WEEK ENDED AUGUST 11, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 11, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	7,918	8,223
Average for 3 prior years	7,867	
Total deaths, first 32 weeks of year	292,236	296,246
Deaths under 1 year of age	576	591
Average for 3 prior years	596	
Deaths under 1 year of age, first 32 weeks of year	19,422	19,809
Data from industrial insurance companies:		
Policies in force	67,369,241	66,695,383
Number of death claims	11,997	12,456
Death claims per 1,000 policies in force, annual rate	9.3	9.8
Death claims per 1,000 policies, first 32 weeks of year, annual rate	10.6	10.3

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

July 15–August 11, 1945

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of Disease." The table gives the number of cases of these diseases for the 4 weeks ended August 11, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period July 15–August 11, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44*

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	950	713	613	2,512	1,667	1,667	4,990	6,201	10,086
New England	19	19	17	1	23	3	522	575	1,297
Middle Atlantic	56	58	58	10	14	14	758	1,125	3,213
East North Central	105	78	86	69	54	81	1,005	976	2,607
West North Central	86	53	51	18	15	15	191	300	387
South Atlantic	211	136	133	564	518	526	129	528	528
East South Central	94	74	50	99	103	85	55	95	153
West South Central	210	159	119	1,574	833	833	332	509	362
Mountain	41	55	51	155	71	159	509	250	407
Pacific	128	81	61	22	36	83	1,489	1,843	1,001
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	428	712	211	1,907	3,255	1,296	3,625	3,185	2,888
New England	24	61	28	146	94	28	261	272	274
Middle Atlantic	81	179	67	638	1,382	83	812	564	564
East North Central	81	107	15	210	495	158	850	816	779
West North Central	38	56	13	66	129	127	333	286	286
South Atlantic	52	115	35	247	598	65	356	377	268
East South Central	52	44	20	131	344	131	194	125	147
West South Central	46	46	15	272	90	89	181	137	120
Mountain	4	14	5	76	17	17	130	174	100
Pacific	50	90	27	121	106	106	508	434	243
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	11	21	23	625	688	966	11,802	9,438	13,822
New England	0	0	0	13	30	26	1,054	670	945
Middle Atlantic	0	0	0	89	45	87	3,148	1,257	2,614
East North Central	3	4	9	45	73	113	2,274	2,274	4,155
West North Central	3	9	9	25	34	52	378	609	760
South Atlantic	0	4	1	140	180	222	1,964	2,195	2,195
East South Central	1	1	1	100	119	185	464	519	539
West South Central	2	1	3	158	160	241	918	902	1,037
Mountain	1	1	4	26	14	44	493	584	584
Pacific	1	1	1	29	33	33	1,109	428	1,227

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis rose from 678 during the 4 weeks ended July 14 to 1,907 during the 4 weeks ended August 11. While every section of the country contributed to the rise, the largest increases were reported from the North Atlantic, North Central, and Mountain sections. About 70 percent of the total cases were reported from 11 States, viz, New York 312, New Jersey 222, Texas 196, Illinois 108, Pennsylvania 104, Tennessee 96, Virginia 92, California 74, Massachusetts 70, Oklahoma 53, and Utah 52, a total of 1,379 cases.

Although a rise in poliomyelitis is expected at this season of the year, the rate of increase in the number of cases during the current 4 weeks was somewhat above that of normal years. With the exception of 1944, the number of cases reported for the country as a whole was the highest

reported for the corresponding period since 1931 when approximately 3,000 cases occurred. The current incidence (1,907 cases) was only about 60 percent of the 1944 figure for this period, but it was nearly 50 percent above the 1940–44 median (1,296 cases). The North Atlantic, South Atlantic, West South Central, and Mountain sections reported the greatest increases over the normal expectancy, with minor increases in two other sections. In the East South Central section the incidence stood at the median level and the West North Central section alone reported a relatively low incidence.

Table 2 shows the total reported cases since the beginning of the year and the incidence by weeks since the first of June, with corresponding data for 1944 and 1943. The year 1943 shows an increase of poliomyelitis cases in the West South Central, Mountain, and Pacific sections, while in 1944 an increase occurred in all sections except the Mountain and Pacific. The current rise first appeared in Texas, in the West South Central section, and has spread mostly into the Atlantic coast regions.

TABLE 2.—*Number of cases of poliomyelitis reported in each geographic area during 1945, 1944, and 1943*

Division	Total Jan. 1–Aug. 11	June					July				August	
		2	9	10	23	30	7	14	21	28	4	11
All regions:												
1945	3,581	71	92	96	116	155	154	253	369	391	476	671
1944	5,051	46	41	[1]111	126	222	290	462	568	738	932	1,015
1943	3,311	52	60	99	136	190	245	297	329	361	450	545
New England:												
1945	206	0	2	3	3	3	11	8	26	34	33	53
1944	130	4	0	1	1	1	4	8	9	12	36	37
1943	120	1	3	3	3	0	1	6	3	11	32	36
Middle Atlantic:												
1945	984	10	12	14	19	22	31	56	95	120	196	227
1944	1,674	11	4	4	12	33	62	125	216	304	413	449
1943	167	0	5	4	8	5	6	14	12	13	20	38
East North Central:												
1945	344	2	3	5	13	10	10	17	19	27	51	113
1944	652	5	4	3	15	10	21	58	63	111	143	178
1943	229	0	3	2	1	1	8	4	12	21	46	79
West North Central:												
1945	128	0	0	0	4	5	5	7	14	8	15	29
1944	191	1	0	2	5	7	9	8	25	22	28	54
1943	305	2	0	2	1	5	9	15	12	40	61	117
South Atlantic:												
1945	497	19	10	16	13	27	23	42	68	55	46	78
1944	1,085	6	3	28	50	103	123	126	128	136	167	167
1943	95	6	0	2	2	2	1	6	9	7	5	8
East South Central:												
1945	317	5	4	11	11	16	25	35	26	42	28	35
1944	584	5	9	10	22	34	37	91	90	101	84	67
1943	101	0	4	0	4	0	6	5	6	14	11	5
West South Central:												
1945	691	26	45	39	42	59	30	56	78	58	58	78
1944	303	8	10	12	15	15	17	26	18	22	27	23
1943	1,124	8	11	35	51	107	137	148	148	141	122	119
Mountain:												
1945	114	5	1	2	2	0	1	3	13	16	18	29
1944	62	0	1	3	3	1	6	2	1	4	4	9
1943	158	2	4	3	8	10	2	9	11	4	29	23
Pacific:												
1945	300	4	15	6	9	13	18	29	30	31	31	29
1944	330	6	10	9	3	18	11	18	18	26	30	31
1943	1,012	33	30	48	58	60	75	90	116	110	124	120

[1] Includes 39 delayed cases in North Carolina.

Diphtheria.—For the 4 weeks ended August 11 there were 950 cases of diphtheria reported, as compared with 713 for the corresponding period in 1944 and a 5-year median of 631 cases. For the country as a whole the current incidence is the highest for this period since 1939 when 1,030 cases were reported. All sections of the country except the North Atlantic and Mountain contributed largely to the excess incidence of this disease. In the North Atlantic sections the number of cases was about normal and in the Mountain section the incidence was about 20 percent below the median. The increases in the other 6 sections ranged from 1.2 times the median in the East North Central region to 2.1 times the median in the Pacific section.

Influenza.—There were 2,512 cases of influenza reported for the current 4-week period, an increase of about 50 percent over the 1940–44 median figure for the same period. Of the total cases Texas, in the West South Central section, reported 1,438 cases, and South Carolina and Virginia, in the South Atlantic section, reported 274 and 211 cases, respectively. The situation was favorable in all other sections of the country.

Meningococcus meningitis.—The number of cases of this disease continued to decline. During the 4 weeks under consideration there were 428 cases reported, as compared with 502 during the preceding 4 weeks. Compared with preceding years the number of cases was 40 percent below the 1944 figure for the same period, but it was about twice the 1940–44 median. In the New England and Mountain sections the incidence dropped to about the median level, but in all other sections the incidence remained relatively high. After 2 years of unusually high prevalence of this disease the number of cases is now decreasing and will probably decline gradually to the level of more normal years.

Scarlet fever.—The incidence of scarlet fever remained at a relatively high level, 3,625 cases being reported for the 4 weeks ended August 11, as compared with a 5-year median of 2,888 cases. Each section except the New England reported an increase over the preceding 5-year median, the excesses ranging from 10 percent in the East North Central section to an incidence in the Pacific region that was more than twice the 5-year median. The current incidence is the highest since 1937, when approximately 3,800 cases were reported for this 4-week period of the year.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—For the 4 weeks ended August 11 there were 4,990 cases of measles reported, which was less than 50 percent of the preceding 5-year median expectancy (approximately 10,000 cases). An increase over the median of about 50 percent occurred in the Pacific section,

but in other sections the incidence was either about normal or considerably lower than the 5-year median figure.

Smallpox.—The smallpox situation remained very favorable, 11 cases being reported for the current 4-week period, as compared with a 5-year median of 23 cases. For the country as a whole the incidence is the lowest on record for this period.

Typhoid and paratyphoid fever.—The number of cases (625) of typhoid fever reported for the 4 weeks ended August 11 was slightly below the incidence during the corresponding period in 1944, and only about 65 percent of the 5-year (1940–44) median. In the Middle Atlantic and Pacific sections the incidence was about normal, but in all other regions the number of cases was considerably below the seasonal expectancy.

Whooping cough.—The incidence of this disease was relatively low. While the number of cases (11,802) was slightly higher than during the corresponding period in 1944, it was about 20 percent lower than the 1940–44 median. In the New England and Middle Atlantic sections the incidence was somewhat above the normal seasonal expectancy, but in all other sections the numbers of cases were less than the 5-year medians.

MORTALITY, ALL CAUSES

For the 4 weeks ended August 11 there were 32,312 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding period in 1942–44 was 31,999 deaths. For the first week of the 4-week period the number of deaths was 6.3 percent less than the preceding 3-year average, but the number during each of the other 3 weeks was larger than the 1942–44 average; the excess, however, dropped from 4.6 percent in the second week to 0.6 percent during the last week of the period.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 18, 1945

Summary

A total of 694 cases of poliomyelitis was reported, representing an increase of only 23 cases during the current week, as compared with an increase of 197 during the preceding week and 238 during the corresponding week last year when the total reported was 1,254. The median for the corresponding weeks of the past 5 years is 549. Increases of more than 7 cases were reported in only 2 States—Tennessee (24 to 36) and California (10 to 25). Increases of more than 3 cases occurred in only 8 other States. Of the total to date, 4,278 cases, as compared with 6,262 last year and 2,821 for the 5-year median, 3,161 were reported for the 8-week period from June 24 to August 18, as compared with 5,480 for the corresponding 8 weeks of 1944. The peak of incidence of the disease is usually reached before the fourth week of September.

Of the total of 79 cases of meningococcus meningitis reported for the current week, only 5 States reported more than 3 cases each, as follows (last week's figures in parentheses): New York 11 (8), Illinois 7 (6), Michigan 4 (5), Tennessee 5 (4), and California 8 (6). The total for the year to date is 6,170, as compared with 13,089 for the corresponding period last year and a 5-year median of 2,396.

Of a total of 462 cases of undefined dysentery, Virginia reported 395 (last week 620), and of 387 cases of bacillary dysentery, Texas reported 299 (last week 409).

Deaths recorded in 93 large cities of the United States totaled 7,642, as compared with 7,919 last week, 8,681 for the corresponding week last year, and a 3-year average of 8,006. The total to date this year is 299,879, as compared with 304,927 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 18, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944	
NEW ENGLAND												
Maine	0	0	0	------	------	------	1	24	24	0	0	0
New Hampshire	0	0	0	------	------	------	0	7	1	1	3	0
Vermont	0	0	0	------	------	------	2	0	12	0	0	0
Massachusetts	1	1	1	------	------	------	45	43	62	0	8	0
Rhode Island	0	0	0	1	------	------	0	1	6	0	1	2
Connecticut	0	0	0	------	------	------	2	3	11	0	1	0
MIDDLE ATLANTIC												
New York	4	5	7	(1)	[1] 2	[1] 3	21	67	134	11	23	7
New Jersey	2	1	2	------	------	1	9	23	45	2	7	2
Pennsylvania	3	3	5	1	3	------	38	17	35	3	15	3
E. NORTH CENTRAL												
Ohio	5	7	3	1	6	2	14	9	16	3	7	1
Indiana	2	2	5	3	3	3	5	2	5	1	2	1
Illinois	5	6	13	------	1	1	59	16	27	7	9	2
Michigan [2]	5	6	4	1	1	1	36	15	39	4	4	3
Wisconsin	2	2	0	8	20	11	35	136	125	3	6	0
W. NORTH CENTRAL												
Minnesota	4	9	1	------	------	------	2	2	6	3	2	0
Iowa	0	0	1	------	------	------	3	2	15	1	0	2
Missouri	1	1	2	------	1	------	6	19	17	1	4	0
North Dakota	6	0	0	3	------	4	0	0	7	0	0	0
South Dakota	4	0	0	------	------	------	2	0	2	1	0	0
Nebraska	0	2	1	------	1	1	1	20	4	0	0	0
Kansas	6	1	2	------	------	------	7	3	9	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	0	0	0	0	0
Maryland [2]	8	5	2	1	------	1	3	3	9	2	3	3
District of Columbia	0	0	0	------	------	------	0	4	4	1	0	1
Virginia	5	5	5	54	24	43	6	13	33	3	3	2
West Virginia	2	2	5	1	4	4	0	4	4	0	2	0
North Carolina	16	8	10	------	1	------	2	8	8	2	1	1
South Carolina	20	7	7	101	102	104	1	5	5	0	0	0
Georgia	11	11	11	7	2	7	2	1	4	1	1	0
Florida	3	5	1	1	4	2	0	4	3	2	6	3
E. SOUTH CENTRAL												
Kentucky	5	3	3	------	------	1	9	2	11	2	2	1
Tennessee	11	2	5	3	2	9	1	12	7	5	2	2
Alabama	2	13	9	35	11	11	0	3	8	1	5	1
Mississippi [2]	13	9	8	------	------	------	------	------	------	1	1	1
W. SOUTH CENTRAL												
Arkansas	4	10	4	13	13	4	0	12	12	1	0	0
Louisiana	2	4	7	3	4	4	3	1	3	2	0	1
Oklahoma	1	4	3	17	------	11	6	2	2	1	0	0
Texas	33	39	25	221	292	175	31	44	44	2	7	2
MOUNTAIN												
Montana	0	2	1	------	1	1	3	0	10	0	1	0
Idaho	1	0	0	3	------	------	19	0	3	0	0	0
Wyoming	0	0	1	------	------	------	3	1	5	0	1	0
Colorado	3	2	3	4	25	11	2	4	8	1	1	1
New Mexico	2	1	1	------	1	1	0	0	2	0	0	0
Arizona	3	2	1	12	30	20	2	15	12	0	0	0
Utah [2]	0	0	0	------	------	------	25	23	19	0	0	0
Nevada	0	0	0	------	------	------	0	0	0	0	0	0
PACIFIC												
Washington	1	3	2	------	------	------	37	19	19	2	2	1
Oregon	7	1	1	------	1	3	13	18	12	1	3	2
California	11	19	9	9	9	15	189	170	101	8	11	2
Total	214	203	185	503	564	506	645	777	1,028	79	145	42
33 weeks	8,284	6,783	7,426	70,732	338,678	169,222	101,210	590,958	537,131	6,170	13,089	2,396

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended August 18, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944		Aug. 18, 1945	Aug. 19, 1944	
NEW ENGLAND												
Maine	0	0	0	8	2	2	0	0	0	0	3	0
New Hampshire	1	6	0	2	0	2	0	0	0	1	0	0
Vermont	2	2	0	0	0	0	0	0	0	0	0	0
Massachusetts	22	30	7	28	46	46	0	0	0	2	3	6
Rhode Island	0	0	2	1	1	1	0	0	0	0	1	1
Connecticut	13	15	7	3	2	3	0	0	0	1	2	1
MIDDLE ATLANTIC												
New York	110	469	42	80	58	55	0	0	0	4	16	12
New Jersey	72	24	12	14	11	18	0	0	0	7	3	6
Pennsylvania	50	108	5	39	38	38	0	0	0	5	4	14
EAST NORTH CENTRAL												
Ohio	15	92	36	52	44	38	0	0	0	7	8	8
Indiana	16	23	5	8	15	13	0	0	0	1	1	6
Illinois	77	34	27	26	26	35	0	0	1	1	4	4
Michigan [2]	10	55	16	40	25	32	0	0	0	1	4	4
Wisconsin	3	11	2	32	53	30	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	9	38	14	11	11	12	0	0	0	0	0	0
Iowa	7	12	8	15	5	9	0	0	0	0	2	1
Missouri	10	4	8	12	6	7	0	0	0	1	1	6
North Dakota	2	4	1	2	3	2	0	0	0	0	0	0
South Dakota	0	0	0	4	0	2	0	0	0	0	0	0
Nebraska	4	2	2	5	1	1	0	0	0	0	0	0
Kansas	1	7	7	19	6	20	0	0	0	3	6	4
SOUTH ATLANTIC												
Delaware	2	4	2	1	0	0	0	0	0	1	0	0
Maryland [2]	8	27	0	13	15	8	0	0	0	1	1	2
District of Columbia	12	19	0	3	4	4	0	0	0	0	0	0
Virginia	25	66	7	14	13	12	0	0	0	6	3	9
West Virginia	6	12	5	17	25	18	0	0	0	3	3	7
North Carolina	6	48	8	26	28	22	0	0	0	3	4	4
South Carolina	11	1	1	5	6	5	0	0	0	4	7	8
Georgia	3	5	1	18	3	6	0	1	0	6	11	11
Florida	3	8	2	2	2	0	0	0	0	1	6	4
EAST SOUTH CENTRAL												
Kentucky	3	35	19	8	2	7	0	0	0	2	7	19
Tennessee	36	5	5	8	9	9	0	0	0	4	5	9
Alabama	7	7	3	10	8	12	0	0	0	2	3	3
Mississippi [2]	3	6	3	7	8	8	0	0	0	2	6	6
WEST SOUTH CENTRAL												
Arkansas	0	2	4	4	5	6	0	0	0	4	5	11
Louisiana	6	4	4	7	3	3	0	0	0	6	1	12
Oklahoma	18	6	6	7	0	3	0	0	0	3	2	6
Texas	55	4	4	31	22	18	0	0	0	10	41	32
MOUNTAIN												
Montana	0	2	1	2	7	4	0	0	0	0	0	0
Idaho	1	0	0	2	5	3	0	0	0	2	0	0
Wyoming	0	2	0	4	2	1	0	0	0	0	0	0
Colorado	7	3	0	8	7	10	0	0	0	1	2	2
New Mexico	0	0	1	6	0	1	0	0	0	1	0	2
Arizona	0	3	0	2	8	1	0	0	0	2	1	1
Utah [2]	8	2	2	2	11	5	0	0	0	1	2	0
Nevada	1	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	22	12	12	10	16	16	0	0	0	2	0	3
Oregon	2	19	4	4	17	5	0	0	0	0	0	2
California	25	16	16	108	70	50	0	0	0	8	2	4
Total	694	1,254	549	730	650	641	0	1	3	109	170	212
33 weeks	4,278	6,262	2,821	134,548	147,592	97,729	265	300	612	2,730	3,257	4,025

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately as follows: Massachusetts 2; New Jersey 1; South Carolina 1; Georgia 2; Texas 2; California 1.

Telegraphic morbidity reports from State health officers for the week ended August 18, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Aug. 18, 1945	Whooping cough: Week ended— Aug. 19, 1944	Whooping cough: Median 1940–44	Week ended August 18, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	24	4	18	0	0	0	0	0	0	0	0
New Hampshire	0	0	0	0	0	0	0	0	0	0	0
Vermont	8	32	21	0	0	0	0	0	0	0	2
Massachusetts	94	63	139	1	10	0	0	0	0	0	2
Rhode Island	7	6	12	0	4	0	1	0	0	0	0
Connecticut	24	37	32	0	8	0	0	0	0	0	3
MIDDLE ATLANTIC											
New York	269	168	241	5	4	0	1	0	1	0	4
New Jersey	155	37	124	0	2	0	0	0	0	0	1
Pennsylvania	156	56	226	0	0	0	0	1	0	0	0
EAST NORTH CENTRAL											
Ohio	149	152	158	0	0	1	0	0	0	0	3
Indiana	18	6	15	3	0	0	1	0	0	0	2
Illinois	97	94	181	1	0	0	0	1	1	0	7
Michigan [2]	53	78	252	0	1	0	0	0	0	0	8
Wisconsin	73	179	214	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota	2	44	50	3	0	0	0	0	2	0	4
Iowa	9	5	26	0	0	0	0	0	0	0	0
Missouri	33	15	17	0	0	3	0	0	0	0	4
North Dakota	2	9	13	0	0	0	0	0	0	0	1
South Dakota	2	4	5	0	0	0	0	0	0	0	0
Nebraska	0	19	6	0	0	0	0	0	0	0	0
Kansas	19	24	47	0	0	0	1	0	0	0	3
SOUTH ATLANTIC											
Delaware	5	1	4	0	0	0	0	0	0	0	0
Maryland [2]	41	56	57	0	0	8	0	2	0	0	0
District of Columbia	8	7	12	0	0	0	0	0	0	0	0
Virginia	39	40	40	0	0	395	0	7	0	5	1
West Virginia	8	34	29	0	0	0	0	0	0	0	0
North Carolina	93	107	107	0	13	0	0	4	0	2	1
South Carolina	55	89	74	0	19	0	0	0	1	13	0
Georgia	14	2	9	1	5	1	0	0	1	27	5
Florida	0	2	3	3	0	0	0	0	0	5	1
EAST SOUTH CENTRAL											
Kentucky	29	60	46	0	6	0	0	2	0	0	0
Tennessee	38	20	47	1	0	8	0	1	0	0	1
Alabama	14	14	15	0	0	0	0	0	0	22	7
Mississippi [2]	------	------	--------	0	0	0	0	0	0	8	4
WEST SOUTH CENTRAL											
Arkansas	8	22	22	0	1	0	0	0	4	0	0
Louisiana	5	9	8	0	1	0	0	0	0	19	0
Oklahoma	15	17	11	0	5	0	0	1	0	0	0
Texas	122	165	165	6	299	19	1	0	0	75	4
MOUNTAIN											
Montana	0	9	22	0	0	0	0	0	0	0	0
Idaho	7	4	4	0	4	0	0	0	0	0	0
Wyoming	3	0	3	0	0	0	0	0	1	0	0
Colorado	39	21	25	0	0	0	0	0	0	0	0
New Mexico	6	0	14	1	1	4	0	0	0	0	0
Arizona	1	9	9	0	0	23	1	0	0	0	0
Utah [2]	18	30	45	0	0	0	0	0	0	0	1
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	22	11	42	0	0	0	0	0	0	0	0
Oregon	13	8	22	0	0	0	0	0	0	0	0
California	248	66	170	0	4	0	13	0	0	0	4
Total	2,045	1,835	3,063	25	387	462	19	19	11	176	81
Same week, 1944	1,835	------	--------	49	546	315	10	17	4	230	77
Average, 1942–44	2,650	------	--------	42	464	310	21	[4] 18	9	[4] 149	------
33 weeks, 1945	84,194	------	--------	1,183	15,995	6,135	279	348	519	2,677	3,110
1944	63,152	------	--------	1,111	13,994	5,184	372	365	379	2,729	2,329
Average, 1942–44	105,816	------	[4] 122,382	1,060	15,948	4,708	374	[4] 365	540	[4] 1,819	------

[2] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.
Anthrax: Connecticut 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 11, 1945

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	4	0	------	0	0	0	1	1	0	0	0	0
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	20	0	5	17	13	0	0	34
Fall River	0	0	------	0	1	0	0	0	2	0	0	0
Springfield	0	0	------	0	1	0	1	0	3	0	0	6
Worcester	0	0	------	0	21	0	8	0	4	0	0	9
Rhode Island:												
Providence	0	0	------	0	0	0	0	0	0	0	0	6
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	0	0	0	0
Hartford	0	0	------	0	0	0	0	1	0	0	0	2
New Haven	0	0	------	0	1	1	1	0	1	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	1	7	2	0	0	2
New York	5	1	------	1	19	4	27	51	37	0	6	181
Rochester	0	0	------	0	0	0	4	15	1	0	0	9
Syracuse	0	0	------	0	0	0	2	0	1	0	0	40
New Jersey:												
Camden	4	0	------	0	3	0	1	0	1	0	0	2
Newark	0	0	------	0	0	0	1	1	2	0	1	18
Trenton	0	0	------	0	0	0	1	13	1	0	0	1
Pennsylvania:												
Philadelphia	0	0	1	0	37	3	14	16	8	0	4	84
Pittsburgh	2	0	------	0	0	0	9	1	1	0	0	41
Reading	0	0	------	0	3	0	0	0	0	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	4	0	7	3	1	0	1	21
Cleveland	0	0	------	0	1	3	3	2	12	0	0	35
Columbus	0	0	------	0	0	0	2	3	2	0	0	1
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	0	0	0	0
Indianapolis	1	0	------	0	0	2	2	1	4	0	0	11
South Bend	0	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	2	0	------	0	0	0	2	0	0	0	0	1
Illinois:												
Chicago	1	0	------	1	58	6	13	11	16	0	1	69
Springfield	0	0	------	0	0	0	0	0	0	0	0	1
Michigan:												
Detroit	2	0	------	0	25	0	6	3	10	0	0	44
Flint	0	0	------	0	0	0	2	1	2	0	0	4
Grand Rapids	0	0	------	0	2	0	2	3	0	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	3	1	0	3	11	0	0	4
Racine	0	0	------	0	1	0	1	0	0	0	0	1
Superior	0	0	------	0	1	0	0	0	2	0	0	6
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	0	0	0	0	0	0
Minneapolis	0	0	------	0	0	0	2	2	11	0	0	0
St. Paul	1	0	------	0	2	1	1	0	1	0	0	21
Missouri:												
Kansas City	0	0	------	0	2	0	4	0	0	0	1	5
St. Joseph	0	0	------	0	0	0	0	0	1	0	0	0
St. Louis	0	1	2	0	4	0	6	3	2	0	0	29

City reports for week ended August 11, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	0	0	0	0	1	0	1	2
Nebraska:												
Omaha	2	0		0	0	0	1	9	1	0	0	1
Kansas:												
Topeka	0	0		0	0	0	0	0	2	0	0	0
Wichita	0	1		0	0	0	2	1	3	0	0	5
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	2	0	1	0	0	
Maryland:												
Baltimore	3	0		0	0	1	7	0	3	0	0	55
Cumberland	0	0		0	0	0	0	0	0	0	0	1
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	1	0		0	1	3	3	13	3	0	0	15
Virginia:												
Lynchburg	0	0		0	0	0	0	0	0	0	0	0
Richmond	0	0		0	0	0	2	15	5	0	0	6
Roanoke	0	0		0	0	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0		0	0	0	0	1	0	0	0	
Wheeling	0	0		0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	3	1	0	0	0	0
Wilmington	0	0		0	0	0	0	0	0	0	0	7
Winston-Salem	0	0		0	0	0	0	1	4	0	0	5
South Carolina:												
Charleston	0	0		0	0	0	1	1	0	0	0	0
Georgia:												
Atlanta	1	0	3	0	0	1	1	1	4	0	1	9
Brunswick	0	0		0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	0	0	4	2	4	0	0	13
Nashville	0	0		0	0	0	0	5	0	0	0	5
Alabama:												
Birmingham	0	0		0	0	0	1	4	2	0	0	0
Mobile	0	0		0	0	0	1	1	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	0	1	1	0	0	0
Louisiana:												
New Orleans	1	0	2	0	3	0	5	0	1	0	1	0
Shreveport	2	0		0	0	0	1	0	0	0	1	0
Texas:												
Dallas	1	0		0	1	0	0	1	3	0	1	3
Galveston	1	0		0	0	0	1	0	0	0	0	4
Houston	1	0		0	2	2	3	2	3	0	1	0
San Antonio	1	0		0	0	0	3	1	1	0	1	0
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	1	0	0	0	0	0
Great Falls	0	0		0	0	0	1	0	1	0	0	0
Helena	0	0		0	1	0	0	0	1	0	0	0
Missoula	0	0		0	0	0	2	1	0	0	0	0
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	1	0	1	0	1	2	5	0	1	36
Pueblo	0	0		0	3	0	0	0	2	0	0	5
Utah:												
Salt Lake City	0	0		0	8	0	4	3	0	0	0	6

City reports for week ended August 11, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	13	1	0	5	2	0	0	5
Spokane	0	0	------	0	1	0	0	0	2	0	0	4
Tacoma	0	0	------	0	13	0	0	0	0	0	0	2
California:												
Los Angeles	4	0	3	1	19	0	1	5	20	0	0	36
Sacramento	0	0	------	0	4	0	2	2	3	0	0	8
San Francisco	1	0	------	0	47	3	5	3	16	0	0	9
Total	43	3	12	3	328	32	188	239	247	0	22	940
Corresponding week, 1944	30	------	12	7	292	------	259	------	178	0	17	685
Average, 1940–44	39	------	23	6	[2] 373	------	[1] 229	------	188	0	38	1,071

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: Boston, 1; Detroit, 1; Spokane, 1.
Dysentery, bacillary.—Cases: Providence, 1; Detroit, 4; Baltimore, 1; Charleston, S. C., 13; Little Rock, 1; Los Angeles, 1.
Dysentery, unspecified.—Cases: Baltimore, 1; San Antonio, 5.
Typhus fever, endemic.—Cases: Wilmington, N. C., 1; Charleston, S. C., 2; Birmingham, 1; Mobile, 3; New Orleans, 2; Shreveport, 3; Galveston, 1; Houston, 6; San Antonio, 10.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,147,300)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	13.1	0.0	0.0	0.0	116	2.6	42.0	49.9	60	0.0	0.0	160
Middle Atlantic	5.1	0.5	0.5	0.5	29	3.2	27.8	48.1	25	0.0	5.1	176
East North Central	3.6	0.0	0.0	0.6	53	7.3	24.9	18.2	36	0.0	1.2	122
West North Central	6.0	4.0	4.0	0.0	18	2.0	31.8	29.8	44	0.0	4.0	125
South Atlantic	8.8	0.0	5.3	0.0	2	8.8	33.6	58.3	35	0.0	1.8	173
East South Central	0.0	0.0	0.0	0.0	0	0.0	35.4	70.8	41	0.0	0.0	106
West South Central	20.1	0.0	5.7	0.0	17	5.7	37.3	14.3	26	0.0	14.3	20
Mountain	7.9	0.0	7.9	0.0	103	0.0	71.5	47.7	71	0.0	7.9	373
Pacific	7.9	0.0	4.7	1.6	153	6.3	12.7	23.7	68	0.0	0.0	101
Total	6.6	0.5	1.8	0.5	50	4.9	28.8	36.6	38	0.0	3.4	144

FOREIGN REPORTS

ANGOLA

Notifiable diseases—January–March 1945.—During the months of January, February, and March 1945, certain notifiable diseases were reported in Angola as follows:

Disease	January		February		March	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Beriberi	43	1	20		5	
Bilbarziasis	317		296		163	
Chickenpox	4		1		7	
Diphtheria	2		2		1	
Dysentery:						
Amebic	97	2	133	1	120	3
Bacillary	2	1			1	
Gonorrhea	238		223		248	
Hookworm disease	673	6	455	7	469	4
Influenza	1,300	8	1,095	12	1,537	11
Leprosy	5		2	1	1	
Measles	51		60		55	
Meningitis, meningococcus	4		4	2	17	1
Mumps	5		23		12	
Pneumonia	203	17	190	15	338	37
Poliomyelitis			1			
Relapsing fever	27		45		43	
Septicemia	1	1			1	1
Smallpox (including alastrim)	30		24		17	
Syphilis	509		382		498	
Tetanus	4	3	2	1	4	2
Trachoma	1					
Trypanosomiasis	147	11	136	11	203	11
Tuberculosis (respiratory system)	44	9	57	4	57	5
Typhoid and paratyphoid fever	8	1	9	1	3	
Whooping cough	118	2	115	6	109	2
Yaws	928		944	1	1,145	

CANADA

Provinces—Communicable diseases—Week ended July 28, 1945.—During the week ended July 28, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		8		25	112	25	18	36	65	289
Diphtheria		4	3	19	1	4				31
Dysentery:										
Bacillary				2					4	6
Unspecified					2					2
German measles				3	6		2	14	6	31
Influenza		5			13	2			1	21
Measles				38	50	3	8	10	41	150
Meningitis, meningococcus				1	2	1			1	5
Mumps		4		10	16	9	8	31	13	91
Poliomyelitis				1	7	1				9
Scarlet fever			7	26	31	5	1	1	5	76
Tuberculosis (all forms)		5	3	100	50	13		2	20	193
Typhoid and paratyphoid fever		1		6	4		8	5		24
Undulant fever				4	2				1	7
Venereal diseases:										
Gonorrhea		22	13	123	183	51	37	43	107	579
Syphilis		4	2	121	77	6	12	9	46	277
Whooping cough		5		78	23		2	12	3	123

CUBA

Habana—Communicable diseases—4 weeks ended July 21, 1945.—During the 4 weeks ended July 21, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chickenpox	1		Tuberculosis	2	
Diphtheria	14	1	Typhoid fever	32	7
Measles	3				

Provinces—Notifiable diseases—4 weeks ended July 14, 1945.—During the 4 weeks ended July 14, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana[1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			1	9	1	9	20
Chickenpox		3	1	1	1	1	7
Diphtheria		15	2				17
Leprosy						4	4
Malaria	5				1	115	121
Measles		2		2			4
Poliomyelitis			1			1	2
Tuberculosis	10	12	12	29	15	39	117
Typhoid fever	32	114	33	93	66	54	392

[1] Includes the city of Habana.

JAMAICA

Notifiable diseases—4 weeks ended July 28, 1945.—During the 4 weeks ended July 28, 1945, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	2	2	Paratyphoid fever		1
Chickenpox	7	11	Puerperal fever	1	
Diphtheria	5	5	Tuberculosis, pulmonary	39	61
Dysentery, unspecified	3	2	Typhoid fever	13	178
Leprosy	1		Typhus fever (murine)	1	2

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Cholera

China.—Cholera has been reported in China as follows: Hupeh Province—Enshih, June 30 to July 11, 1945, 3 cases; Hingshan, July

13, 1 case, 1 death; Maoping, July 12, 2 cases; Tzekwei, July 11, 8 cases, 5 deaths; Kweichow Province—Tsunyi, June 24–29, 4 cases, 2 deaths; Sikong Province—Yaan, July 17, present; Szechwan Province, May 5 to July 12, 1945, 626 cases, 180 deaths.

Plague

Canada—Alberta Province.—A report dated August 7, 1945, stated that plague infection was proved in a pool of fleas collected from squirrels near Cereal, and in another pool of fleas collected in Pollockville, Alberta Province, Canada.

Ecuador—Loja Province.—For the month of July 1945, 11 cases of plague with 5 deaths were reported in Loja County, Loja Province, Ecuador.

Great Britain—Malta.—For the week ended August 4, 1945, 1 case of plague was reported in Zurrie and for the week ended August 11, 1945, 1 fatal case of plague was reported for which no specific location was given.

Morocco (French).—For the period July 21–31, 1945, 73 cases of plague were reported in French Morocco.

Peru.—For the month of June 1945, plague was reported in Peru as follows: Lambayeque Department, Province of Chiclayo, Villa de Eten, 1 case; Lima Department, Province of Chancay, Huacho city, 1 case. Plague infection in rodents was also reported in Huacho, Villa de Eten, and Trujillo, Peru.

Portugal—Azores.—Ponta Delgada—Banlieue.—For the period July 15 to August 11, 1945, 4 cases of plague were reported in Banlieue, Ponta Delgada, Azores, Portugal.

Smallpox

Morocco (French).—For the period July 21–31, 1945, 203 cases of smallpox were reported in French Morocco.

Typhus Fever

Ecuador.—For the month of July 1945, 61 cases of typhus fever with 3 deaths were reported in Ecuador. Cities reporting the highest incidence are as follows: Ambato, 13 cases, 1 death, Guayaquil, 9 cases (murine type), Ibarra, 17 cases, 1 death, Quito, 14 cases.

Morocco (French).—For the period July 21–31, 1945, 418 cases of typhus fever, including 15 cases reported in Casablanca and 6 cases in Rabat, were reported in French Morocco.

Peru.—For the month of June 1945, 79 cases of typhus fever were reported in Peru. Departments reporting the highest incidence are as follows: Cuzco, 25 cases, Cajamarca, 18 cases, Libertad, 11 cases.

Turkey.—For the week ended August 11, 1945, 26 cases of typhus

fever were reported in Turkey, including 2 cases in Istanbul, 2 cases in Izmir, 1 case in Kocaeli, and 1 case in Zonguldak.

Yellow Fever

Colombia.—Yellow fever has been reported in Colombia as follows: Magdalena Department, San Juan de Cesar, July 7–15, 1945, 2 deaths; Norte de Santander Department—Municipality of Cucuta, June 24–29, 1945, 2 deaths, July 14, 1945, 1 death, Municipality of Sardinata, June 21, 1945, 1 death.

Gold Coast—Winneba.—On August 2, 1945, 1 confirmed fatal case of yellow fever was reported in Winneba, Gold Coast.

Peru—Cuzco Department—Quincemil.—During the month of May 1945, 1 confirmed case of yellow fever was reported in Quincemil, Cuzco Department, Peru.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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PHYSICAL IMPAIRMENTS OF MEMBERS OF LOW-INCOME FARM FAMILIES—11,490 PERSONS IN 2,477 FARM SECURITY ADMINISTRATION BORROWER FAMILIES, 1940 [1]

V. DEFECTS OF THE NASAL SEPTUM; AND CHRONIC RESPIRATORY AFFECTIONS, EXCLUSIVE OF DISEASED TONSILS

By MARY GOVER, *Associate Statistician*, and JESSE B. YAUKEY, *Statistician, United States Public Health Service*

This series of studies is based on physical examination findings for members of low-income farm families in the United States. The prevalence of impairments and chronic diseases as found for samples of our low-income farm population in eastern, central, and southern sections of the country will, it is hoped, be somewhat of a contribution to our knowledge of the normal individual in a population group for which there is little specific information of this sort at the present time. In the absence of a control urban group available data from other sources have been assembled for comparison with the physical examination findings for the low-income farm families.

SOURCE OF DATA

During the period November 1939 through November 1940 the Farm Security Administration made general physical examinations of the members of borrower families residing in selected areas in connection with the health aspects of their rehabilitation program. The physical examinations were conducted by physicians assembled mainly from colleges or universities located in the various sections. The same professional staff frequently worked in adjacent areas. Eye, ear, nose and throat examinations were made by appropriate

[1] From the Division of Public Health Methods, U. S. Public Health Service, in cooperation with the Farm Security Administration, Department of Agriculture. Mr. Yaukey is detailed to the Farm Security Administration.

This is the fifth in a series of papers dealing with physical defects found on examination of members of low-income farm families residing in 19 localities in the United States. The physical findings of the examinations were coded and transferred to punch cards by the Farm Security Administration under the direct supervision of Mr. Yaukey. The data were subsequently made available to the Public Health Service. Acknowledgment is made to Dr. S. D. Collins for critical suggestions and advice throughout the preparation of the studies.

specialists; children under 15 years of age were examined by pediatricians; the men by internists and the women by gynecologists. The mental age tests were conducted by groups of psychologists, and dentists made the dental examinations. The examinations were not made primarily for statistical purposes but rather to determine the health status of farmers and their families applying to the Farm Security Administration for rehabilitation loans. An effort was made to keep the examining procedure as uniform as possible but the results, on the whole, must be considered as representing an average opinion of a relatively small number of examining physicians.

The selected localities consisted, usually, of entire counties, and practically all Farm Security Administration borrower families residing within the selected counties came to the clinics for examination; among the white families represented at the clinics 91 percent of all members were examined. Thirteen of the selected areas were located in Southern States and six in Northern or Intermediate States. In nine of the Southern counties white and Negro families were examined, the examinations of both whites and Negroes being made by the same physicians. The data, therefore, seem favorable for a racial comparison. There may, however, have been some selection of Negro farmers on the basis of good physical condition since loans were made by the Farm Security Administration to farm operators only, and it is reasonable to expect that Negro farm operators are a somewhat more selected group than white operators.

The examined population (9,776 whites and 1,714 Negroes) has a comparatively young age distribution, due probably to the fact that relatively young heads of families were selected for rehabilitation loans. On the whole, the age distribution of the examined population does not differ widely in the various localities.

With respect to economic status the Bureau of Agricultural Economics estimates an average annual net income of $767 per farm for all farms in 1940; while a comparable average annual net income for all rural rehabilitation farms, estimated by the Farm Security Administration, is $500 in 1940, or approximately 35 percent less than that for all farms.

A somewhat more detailed account of the characteristics of the examined population can be obtained by reference to a preceding study (*6*) in this series.

DEFECTS OF THE NASAL SEPTUM

The nasal septum was recorded on the physical examination forms used by the Farm Security Administration as normal, deviated to the right or left, or perforated. No statement as to the degree of deviation was called for; and the records, therefore, include slight as well as marked deviations of the nasal septum, the limits between

slight and marked being set by individual examiners. Extreme abnormalities were recommended for surgical treatment.

The prevalence of deviated septum, and of deviated septum for which surgery was recommended, among white persons in each of 19 localities is shown in table 1. Only about 3 percent of the cases of deviated septum reported for persons over 15 years of age were recommended for surgical treatment. The records, therefore, include a large number of quite minor abnormalities. The recorded prevalence shows no particular relationship with geographic section; it is, however, associated with the examiner as seen in the following table:

Prevalence of deviated septum among white persons 45 years and over as recorded by 4 different examiners

NORTHERN COUNTIES

Examiner A		Examiner B	
County	Percent	County	Percent
Aroostook County, Maine	36.2	Howard County, Neb	56.6
Champaign County, Ohio	18.5	Phillips County, Colo	62.5
Callaway County, Mo	37.0		
Spotsylvania County, Va	16.7		

SOUTHERN COUNTIES

Examiner C		Examiner D	
County	Percent	County	Percent
Carroll County, Miss		Okfuskee County, Okla	8.4
Leflore County, Miss	58.2	Panola County, Tex	22.9
Humphreys County, Miss		Williamson County, Tex	6.6
Pope County, Ark	76.5	Runnels County, Tex	6.5
Franklin Parish, La	62.6		

The four physicians who made examinations of nose and throat in more than one locality clearly show a tendency to use different standards in recording minor abnormalities. In the two Southern groups of localities the differences between the percentages recorded by the two examiners are marked, while the differences between the percentages for localities examined by the same physician are less than or just about three times the probable error. That is, the differences between examiners are significant but between counties for the same examiner they are not significant or doubtfully so.

For a total of 19 localities (table 1) the recorded prevalence of deviated septum is comparatively infrequent under 15 years of age (13 percent). In the age groups 15 to 44 and 45 years and over, respectively, 37 and 39 percent of persons examined had a deviation of the nasal septum. Variability in the recorded percentages is extreme, from approximately 5 to 80 percent, with about half the localities showing recorded percentages of 30 to 65 percent. Only 0.9

TABLE 1.—*Prevalence of deviated and perforated septum among white persons in 3 age groups—members of Farm Security Administration borrower families in 19 localities, 1940*

Geographic area	State	County	Examined for defect of the nasal septum			Deviated septum						Perforated septum		
						Total			Surgery recommended					
			Under 15	15-44	45 and over	Under 15	15-44[1]	45 and over[1]	Under 15	15-44	45 and over	Under 15	15-44	45 and over
			Number			Defects per 100 persons examined								
New England	Maine	Aroostook	451	286	127	17.1	32.2	36.2					0.3	0.8
East North Central	Ohio	Champaign	172	183	65	7.0	20.2	18.5		0.5	3.1		.5	6.2
	Indiana	Montgomery	132	136	67	3.8	80.9	83.6	0.8				.7	3.0
West North Central	Missouri	Callaway	283	231	118	2.1	21.6	37.0		1.7	2.5		.4	
	Nebraska	Howard	248	218	83	15.3	47.2	56.6	.4	.5	7.2			1.2
Mountain	Colorado	Phillips	162	105	64	9.9	57.6	62.5		.6				1.6
South Atlantic	Virginia	Spotsylvania	72	60	36	6.9	23.3	16.7			2.8	1.4		
	North Carolina	Avery	91	100	38	4.4	47.0	65.8		5.0	2.6			
	South Carolina	Kershaw	307	271	93	3.3	10.3	16.1						
	Georgia	Worth	277	209	60		34.0	31.7		.5	1.7			
	Florida	Levy	198	237	114	3.0	33.3	43.0	.5	1.3	.9		.4	.9
East South Central	Tennessee	Henderson	239	227	65	5.0	28.6	32.3		2.6	1.5	.4		3.1
	Mississippi	Carroll, Leflore, Humphreys	191	164	55	25.7	47.6	58.2				12.0	18.3	25.5
West South Central	Arkansas	Pope	328	319	85	47.0	75.5	76.5		1.3		.3	.9	1.2
	Oklahoma	Okfuskee	250	242	108	1.2	9.1	8.4		.4	.9			
	Louisiana	Franklin	466	394	105	33.9	64.1	62.6		1.3	.9			
	Texas	Panola	115	127	48	2.6	15.0	22.9		.8	2.1			2.1
		Williamson	135	126	61	1.5	4.0	6.6						1.6
		Runnels	122	126	62	.8	10.3	6.5		.8			.8	1.6
19 localities			4,239	3,821	1,454	13.2	37.2	39.3	.1	.9	1.3	[2].1	[2].2	[2]1.4

[1] The range of the probable errors of the percentages with deviated septum is from 1.3 to 3.7 percent for the age group 15-44 years, and from 2.6 to 5.2 percent for the age group 45 years and over.
[2] Exclusive of Carroll, Leflore, and Humphreys Counties, Miss

and 1.3 percent of persons 15 to 44 and 45 years and over, respectively, had a deviation of the nasal septum marked enough for surgery to have been recommended.

Perforated septum was recorded for 0.2 and 1.4 percent of persons 15 to 44 and 45 or more years of age, respectively, in a total of all localities exclusive of Carroll, Leflore, and Humphreys Counties, Miss. Among the total of 95 cases of perforated septum, 67 cases or 71 percent occurred in the families examined in the three counties of Mississippi. The reason for the high recorded rate in this locality is unknown.

TABLE 2.—*Prevalence of deviated septum among white persons in specific age groups—members of Farm Security Administration borrower families in a total of 19 localities, 1940*

Age	Examined for defect of the nasal septum			Both sexes		Male		Female	
				Deviated septum		Deviated septum		Deviated septum	
	Both sexes	Male	Female	Total	Surgery recommended	Total	Surgery recommended	Total	Surgery recommended
	Number			Defects per 100 persons examined					
All ages	9,514	4,873	4,641	26.9	0.6	29.5	0.9	24.0	0.2
Under 5	1,159	559	600	3.4	—	3.2	—	3.5	—
5–9	1,470	762	708	13.3	.1	13.4	.1	13.1	—
10–14	1,610	831	779	20.4		21.7		19.0	
15–19	995	521	474	31.9	.5	31.5	.7	32.3	.4
20–24	500	201	299	33.0		35.3		31.4	
25–29	505	243	262	38.4	1.4	46.5	2.5	30.9	.5
30–34	616	284	332	40.4		44.7		36.7	
35–39	613	305	308	41.3	1.1	44.3	1.8	38.3	.3
40–44	592	306	286	41.0		49.0		32.5	
45–49	510	259	251	35.5	1.1	41.7	1.8	29.1	.2
50–54	416	251	165	42.1		45.8		36.4	
55–59	239	145	94	43.1	.5	45.5	.8	39.4	—
60–64	149	109	40	45.0		51.4		27.5	
65 and over	140	97	43	32.9	1.4	35.1	2.1	27.9	—

Tables 2 and 3 show the age-specific prevalence of deviated septum recorded for members of Farm Security Administration borrower families in a total of 19 localities and as recorded in comparable data for (a) school children in 8 counties of the eastern United States (*3*), (b) Life Extension Institute first check-up health examinations of policyholders (*1, 8, 9*), (c) members of Baltimore families and medical students reporting minor respiratory attacks to the John J. Abel Fund investigation of the common cold (*4*), and (d) National Youth Administration examinations (*6*). The Life Extension Institute (*9*) examinations show a prevalence rate of deviated septum for those examined at the head office in New York City which is 2.5 times the rate for those examined in other cities; agricultural workers have slightly lower rates than urban groups examined at other than the head office in New York City (see note 2, table 3). The differ-

TABLE 3.—*Prevalence of deviated septum among white persons in specific age groups—data comparable with the Farm Security Administration examination of nasal septum*

Age (years)	School children[1]		Life Extension Institute				Baltimore[4]	National Youth Administration[5]	
			Male[2]			Total female[3]			
	Boys	Girls	Total	New York City (head)	Other cities (field)		Both sexes	Male	Female
	Percent								
Under 5							21.9 (under 15)		
5–9	1.3	1.1							
10–14	2.4 (10–19)	1.4 (10–19)							
15–19							71.9 (15 and over)	3.6	2.2 (15–24)
20–24			35.7	71.6	27.3	32.7 (20–29)		4.6	
25–29			35.8	70.8	28.4				
30–34			36.3	73.0	29.5	34.6			
35–39			35.0	70.4	28.7	33.0			
40–44			34.4	71.5	28.4	32.2			
45–49			32.9	71.1	26.7	30.5			
50–54			30.9	63.7	26.0	28.1			
55–59			31.9	70.1	26.4	27.6			
60–64			27.6	62.9	23.3	29.5 (60 and over)			
65 and over			26.3	63.5	21.8				

[1] From Collins (*2*), 1915–1925. Percentages are averages of 8 localities for the age groups 6–9 and 10–18 years. The prevalence of deviated septum (6–18 years) in each locality for both sexes combined is as follows: Frederick County, Md., 1.3 percent; Nassau County, N. Y., 1.2 percent; Spartanburg, S. C., 0.9 percent; Pinellas County, Fla., 0.3 percent; Orange County, Fla., 0.5 percent; Dunklin and New Madrid Counties, Mo., 0.3 percent; Du Page County, (a) 6.4 percent; and Du Page County (b) 1.9 percent.

[2] From Sydenstricker and Britten (*9*), 1922–1925. The prevalence of deviated septum for broad occupational classes of males examined at the head office (New York City) and in field offices is as follows:

Locality	Professional	Business	Skilled trade	Agricultural
New York City (head office)	71.6	71.3	71.6	
Other cities and agricultural (field offices)	27.8	28.9	28.1	19.9

[3] From Britten (*1*), 1922–1925.

[4] From Gafafer (*4*), 1928–1930. The prevalence of deviated septum is given for two broad age groups, under 15 and 15 years and over for healthy persons participating in the John J. Abel research on the common cold.

[5] From McDowell and Meroney (*6*), 1941. Cases of marked deviation only were recorded; male percentages are for the age groups 16–20 and 21–24 years; female, 16–24 years.

ence in level between the rates as shown for New York City and other cities is probably due, according to the author's statement, to the close cooperation existing between examiners at the head office in New York City. The members of Baltimore families and medical students (*4*) were examined by the same individual or the same group of individuals and show a prevalence of deviated septum approximately equal to that recorded for New York City. For ages over 20 years, both the New York City and Baltimore prevalence rates are approximately 75 percent higher than those recorded for members of Farm Security Administration borrower families. The rates for rural rehabilitation families are not uniform in the various localities, however, as shown in table 1, two of the localities having a higher prevalence of deviated septum than that recorded for New York or Baltimore.

Figure 1 shows the prevalence of deviated septum at specific ages; the rates being plotted on semilogarithmic paper. The prevalence of deviated septum as recorded in the Farm Security Administration examinations increases rapidly up to 30 years of age for males and up to 20 years of age for females; but remains practically constant throughout adult ages. The National Youth Administration (*6*) examinations and the Public Health Service (*2*) examinations of school children recorded only marked deviations of the nasal septum and show an increase in the rates up to 25 years; the Life Extension Institute (*8*) examinations for ages over 20 years show practically constant rates at those ages.

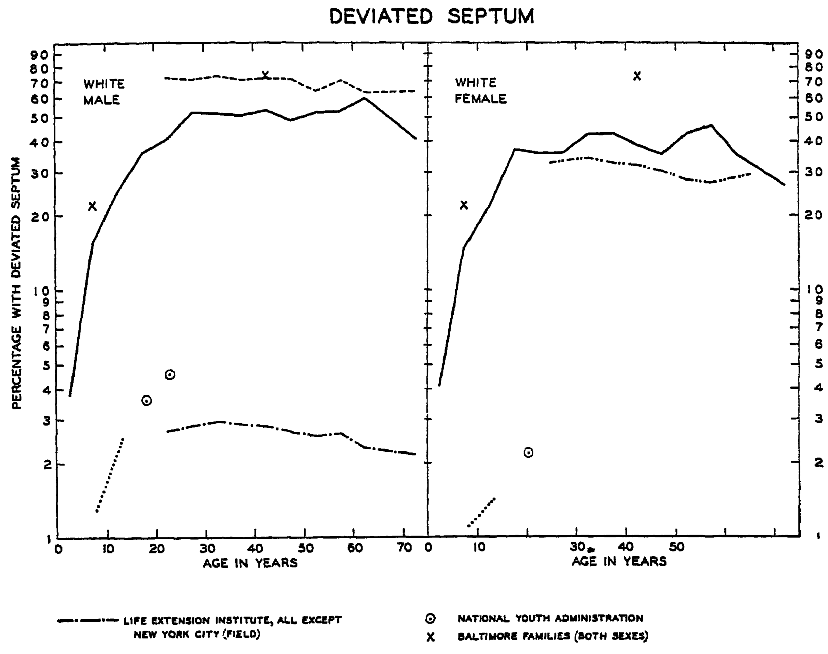

FIGURE 1.—Age-specific prevalence (logarithmic scale) of deviated septum—members of Farm Security Administration borrower white families in a total of 19 localities, 1940, and available data for other groups.

Tables 2 and 4 and figure 2 show a comparison of male and female prevalence of deviated septum. Among members of Farm Security Administration borrower families rates are the same for males and females under 20 years of age; during adult ages, however, rates for white males are on the average 30 percent higher than those for white females. Between the ages of 25 and 55 years, prevalence rates for deviated septum are approximately 30 percent higher for Negro males than females, but over 55 years of age they are practically the same for the two sexes. The Life Extension Institute (*1*) examinations (table 3) show rates for ages over 20 years that are only slightly higher for males than females. The National Youth Administration (*6*) examina-

tions give a prevalence rate of 3.8 percent for white males 16 to 24 years of age and 2.2 percent for females.

Table 4 and figure 3 show a comparison of the prevalence of deviated septum among whites and Negroes. For every age group and for both males and females the prevalence of deviated septum is markedly higher among whites than Negroes. For all ages combined, the rates for whites are approximately 2.5 times those for Negroes, the rela-

TABLE 4.—*Prevalence of deviated septum among Negro and white persons in specific age groups—members of Farm Security Administration borrower families in a total of 9 [1] localities, 1940*

Age	Negro						White					
	Examined for defect of the nasal septum			Deviated septum			Examined for defect of the nasal septum			Deviated septum		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Number			Percent			Number			Percent		
All ages	1,687	838	849	10.5	11.5	9.5	4,931	2,530	2,401	29.7	30.8	28.5
Under 5	199	89	110	2.0	2.2	1.8	584	277	307	5.0	4.7	5.2
5–14	585	299	286	8.5	9.7	7.3	1,620	842	778	22.2	22.9	21.3
15–24	326	158	168	12.3	11.4	13.1	828	390	438	35.0	29.7	39.7
25–34	134	54	80	11.9	13.0	11.3	589	282	307	41.9	46.8	37.5
35–44	171	65	106	14.6	18.5	12.3	606	306	300	44.1	47.1	41.0
45–54	159	94	65	15.7	19.1	10.8	452	263	189	36.9	38.8	34.4
55–64	82	58	24	12.2	8.6	20.8	189	126	63	44.4	50.0	33.3
65 and over	31	21	10	22.6	23.8	20.0	63	44	19	33.3	36.4	26.3

[1] The nine localities are: Spotsylvania County, Va., Kershaw County, S. C., Worth County, Ga.. Levy County, Fla., parts of Carroll, Leflore and Humphreys Counties, Miss., Pope County, Ark., Okfuskee County, Okla., Franklin Parish, La., and Panola County, Tex.

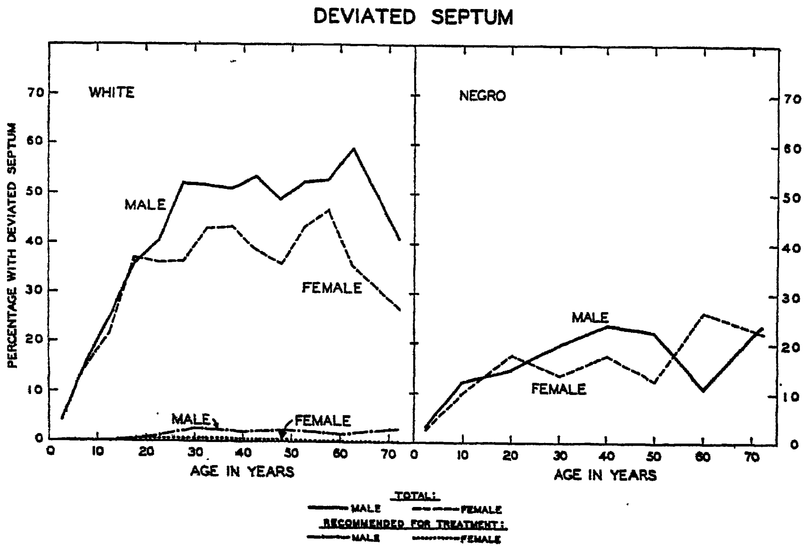

FIGURE 2.—Male and female age-specific prevalence of deviated septum as found on physical examination of members of Farm Security Administration borrower white families in a total of 19 localities, 1940.

tive difference being slightly more among females than males. A tabulation for separate localities shows a consistently low rate for Negroes compared with the white rate in every locality. The National Youth Administration (*6*) examinations give a prevalence rate for both sexes, 16 to 24 years of age, of 3.0 percent for whites and 0.7 percent for Negroes; or a white rate which is 4 times that of the Negro.

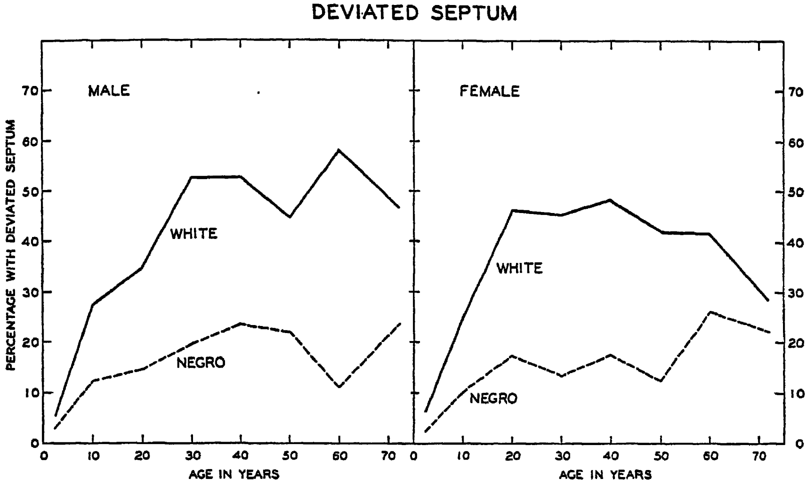

FIGURE 3.—Negro and white age-specific prevalence of deviated septum as found on physical examination of members of Farm Security Administration borrower families in a total of 9 localities, 1940.

OTHER CHRONIC RESPIRATORY AFFECTIONS

The prevalence of certain other defects and chronic diseases of the repiratory system exclusive of diseased tonsils is shown in table 5 for white males and females in a total of 11 localities for which the data have been tabulated, and for Negro males and females in a total of the 5 southern localities included. Several of the diseases show sex differences in prevalence which are outstanding and are possibly associated with the occupation of farming. The prevalence of asthma, chronic bronchitis, and pulmonary emphysema is significantly higher for males, being 5 or more times as frequent among males as females. Sinusitis is slightly more prevalent among males but not significantly so. For rates based on 5 localities there is no significant difference between Negro and white prevalence for any of the respiratory affections shown in table 5.

Regarding respiratory conditions, it is obvious that the method of physical examination does not give prevalence rates which are as complete for these chronic affections as for defects in a stricter sense of the word. Among the chronic conditions shown in tables 5 and 6 hay fever and bronchitis are probably less completely reported than asthma, pulmonary emphysema, or sinusitis.

Hay fever and asthma.—Cases tabulated as "hay fever" in these data include typical cases of hay fever due to sensitivity to the proteins of, mainly, pollens and animal emanations, and uncomplicated by asthma. The recorded rate for hay fever is less than 1 percent in each of the localities shown in table 5, the total of all

TABLE 5.—*Prevalence of specific respiratory diseases among white and Negro males and females—members of Farm Security Administration borrower families, 1940*

Sex, color, and locality	Total examined	Polyps of the nasal cavity	Hay fever	Asthma	Bronchitis		Pulmonary emphysema	Sinusitis
					Acute	Chronic		
	Number	Percent						
White male (11 localities)	3,000	0.20	0.33	1.07	0.27	0.87	1.57	6.00
White female (11 localities)	2,905	.21	.28	.21	.17	.07	.21	4.96
Negro male (5 localities)[1]	494	-----	-----	.81	-----	1.21	1.01	3.04
Negro female (5 localities)[1]	499	-----	-----	.20	-----	.20	-----	1.80
White male (5 localities)[1]	1,430	.07	.28	1.40	.21	1.54	2.38	2.24
White female (5 localities)[1]	1,360	.15	.07	.15	.29	.07	-----	.66
White (both sexes):								
Maine, Aroostook County	884	.11	.11	.57	.11	.11	.79	10.97
Ohio, Champaign County	429	1.17	.70	.70	.47	-----	.70	3.26
Indiana, Montgomery County	355	-----	.56	.28	.28	-----	.28	6.76
Missouri, Callaway County	675	.44	.44	.44	.30	-----	.30	20.00
Virginia, Spotsylvania County	172	-----	-----	1.74	-----	-----	-----	15.12
North Carolina, Avery County	239	-----	.84	1.26	-----	-----	.42	3.77
South Carolina, Kershaw County	679	.15	-----	.15	.44	1.33	1.77	-----
Florida, Levy County	539	-----	.17	.51	.51	2.02	3.54	.51
Tennessee, Henderson County	533	-----	.38	.19	-----	.75	1.13	.75
Arkansas, Pope County	745	.27	.27	.94	.13	.27	-----	1.07
Oklahoma, Okfuskee County	601	-----	.33	1.33	-----	-----	-----	.67
11 localities	5,905	.20	.30	.64	.22	.47	.90	5.49

[1] The 5 localities are: Spotsylvania County, Va.; Kershaw County, S. C.; Levy County, Fla.; Pope County, Ark., and Okfuskee County, Okla.

localities having a prevalence rate of 0.3 percent. Although the rates vary in the several localities the cases are fairly well scattered (table 5) and do not concentrate in those counties where examinations were made in the months of maximum incidence of hay fever (August and September).[2]

Other unpublished data available among our records also show an unexpectedly low prevalence or incidence of hay fever. Surveys conducted simultaneously in Cattaraugus County and Syracuse, N. Y. (*10*) and a survey made by the Committee on the Costs of Medical Care (*3*) in 130 localities give incidence rates for hay fever of approximately 0.4 and 0.2 percent, respectively, for all ages. The New York State survey shows no difference between the rates for Syracuse and the rural county area, 0.38 and 0.35 percent, re-

[2] Examinations were made during January in Pope County, Ark., during April in Avery County, N. C., and Kershaw County, S. C., during May in Levy County, Fla., during June in Champaign County, Ohio, during July in Montgomery County, Ind., during August in Aroostook County, Maine, Callaway County, Mo., Spotsylvania County, Va., and Okfuskee County, Okla., and during November in Henderson County, Tenn.

spectively, for all ages;[3] the Committee on the Costs of Medical Care survey shows a significantly higher incidence of hay fever in cities than in rural areas, 0.23 and 0.03 percent, respectively, for all ages.[3] It is quite possible that the urban and rural difference shown by the Committee on the Costs of Medical Care survey reflects better diagnosis in cities where there are relatively more allergy specialists.

The number of cases of hay fever reported among Farm Security Administration borrower families is too few for a reliable age-specific prevalence. The prevalence of cases of hay fever from the National Health Survey (*7*) and based on 26,120 cases of hay fever among 2,488,180 white and colored persons in 83 cities[4] is shown in figure 4. The National Health Survey was conducted in the winter, that is, not in the hay fever season, but includes all persons reported to have hay fever. Age-specific prevalence rates increase until approximately 30 years of age and remain constant or decline somewhat thereafter (fig. 4); approximately 1.5 percent of persons 35 to 44 years of age reported having had attacks of hay fever during the year. Among a group of medical officers of the United States Army, Navy, and Public Health Service and college faculty members and their families (*11*) making semimonthly reports of the incidence of colds to the United States Public Health Service 6.3 percent of persons 35 to 44 years of age stated that they had had attacks of hay fever at some time prior to the beginning of the study.[3] The age-specific prevalence of hay fever based on prior history of attack for members of medical officers' families is shown in figure 4 and resembles the age-specific prevalence of hay fever as given in the same figure for the National Health Survey, except that it is on a considerably higher level.

"Asthma" as applied to survey data usually includes asthma due to an allergy, as an accompaniment of chronic bronchitis and emphysema, or as an accompaniment of heart disease. Since the Farm Security Administration examinations of low-income farmers were made by physicians, the diagnosis of asthma was probably fairly uniform and consists largely of asthma due to an allergy. Among the 38 individuals whose records contained a diagnosis of asthma, only 2 were recorded as having hay fever; 1 emphysema; 1 both hay fever and emphysema; 1 chronic bronchitis; and 4 heart disease.

The age-specific prevalence of asthma found upon examination of members of Farm Security Administration borrower families is shown in table 6. No cases of asthma were reported under 5 years of age; after 5 years the prevalence rates increase at a moderate rate through-

[3] Unpublished data.
[4] In press.

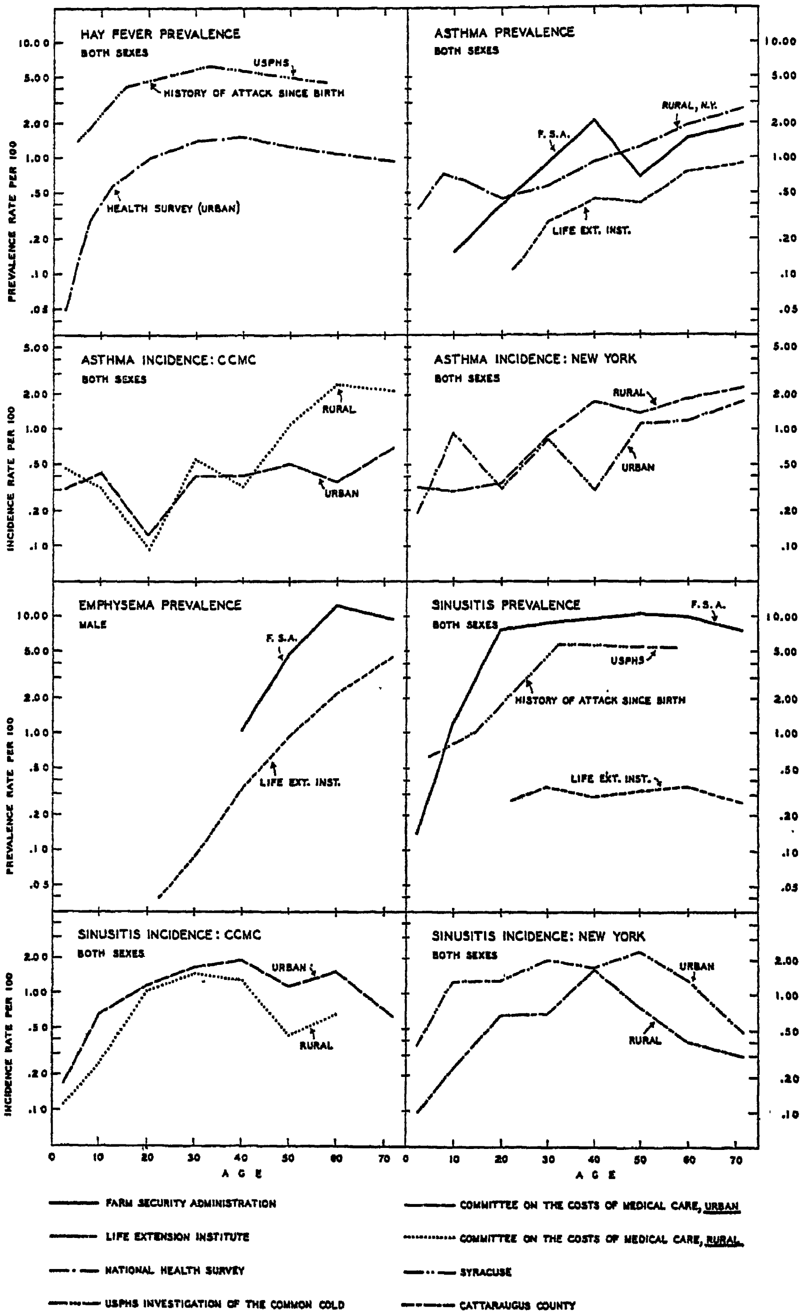

FIGURE 4.—Age-specific *prevalence* of hay fever, asthma, pulmonary emphysema and sinusitis among members of Farm Security Administration borrower white families, 1940, and available data of other groups; also the age-specific *incidence* (white) of asthma and sinusitis in urban and rural areas as recorded in New York State and by the Committee on the Costs of Medical Care Survey. (The data are unpublished with the exception of the Life Extension Institute (9) and the National Health Survey (in press).)

out life (fig. 4). In these data there is a peak in asthma prevalence at 40 years of age which is of doubtful significance. The age-specific prevalence of asthma recorded in the National Health Survey (*7*) and based on 22,742 cases of asthma among 2,498,180 white and colored persons in 83 cities [4] is shown in figure 4. In these data there is a peak in the prevalence of asthma at 5 to 9 years, followed by a decline until 20 years, and a continued increase at a moderate rate, after 20 years of age.

TABLE 6.—*Prevalence of specified respiratory diseases among white persons in specific age groups—members of Farm Security Administration borrower families, 1940*

Age	Total examined in 11 localities [1]			Hay fever			Asthma		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Number			Percent					
All ages	5,905	3,000	2,905	0.30	0.33	0.28	0.64	1.07	0.21
Under 5	733	355	378	--------	--------	--------	--------	--------	--------
5–14	1,837	944	893	.11	.11	.11	.16	.21	.11
15–24	991	478	513	--------	--------	--------	.40	.84	--------
25–34	663	304	359	.30	.33	.28	.90	1.64	.28
35–44	726	363	363	1.52	1.65	1.38	2.07	3.31	.83
45–54	581	318	263	.52	.63	.38	.69	.94	.38
55–64	268	166	102	--------	--------	--------	1.49	2.41	--------
65 and over	106	72	34	--------	--------	--------	1.89	2.78	--------
	Sinusitis			Bronchitis (acute and chronic)			Pulmonary emphysema		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Percent								
All ages	5.49	6.00	4.96	.69	1.13	.24	.90	1.57	.21
Under 5	.14	--------	.26	--------	--------	--------	--------	--------	--------
5–14	1.25	.95	1.57	.11	--------	.22	--------	--------	--------
15–24	7.67	9.83	5.65	.61	1.05	.19	--------	--------	--------
25–34	8.90	8.22	9.47	1.21	2.30	.28	--------	--------	--------
35–44	9.50	9.92	9.09	1.24	2.48	--------	.69	1.10	.28
45–54	10.50	11.32	9.51	1.55	2.52	.38	2.93	4.72	.76
55–64	10.07	13.25	4.90	2.24	2.41	1.96	8.58	12.65	1.96
65 and over	7.55	6.94	8.82	.94	1.39	--------	7.55	9.72	2.94

[1] The 11 localities are as given in table 5.

Urban and rural age-specific incidence of asthma is shown in figure 4 for Syracuse, N. Y. and 5 townships of Cattaraugus County, N. Y. (*10*) and for urban and rural areas from the data collected by the Committee on the Costs of Medical Care (*3*). Rates for all ages (including all sickness within the study year regardless of date of

[4] In press.

onset) are as follows: Syracuse, N. Y., 0.74 percent; Cattaraugus County, N. Y., 1.02 percent; Committee on the Costs of Medical Care, urban, 0.36 percent; and, rural, 0.54 percent.[3] Both the New York State survey and the Committee on the Costs of Medical Care show a higher incidence of asthma in rural than in urban areas; the difference is due mainly to high rates at ages over 40 or 50 years in rural areas (fig. 4). For the Life Extension Institute (*9*) examinations, white males aged 20 years and over show rates of 0.3 percent in New York City, 0.4 percent in other cities, and 0.7 percent in agricultural areas.

Chronic bronchitis and emphysema.—Although the recorded prevalence of chronic bronchitis is somewhat higher than acute bronchitis, 0.5 and 0.2 percent, respectively, inspection of table 5 indicates that considerable chronic bronchitis must have been missed on examination of the members of borrower families. Six of the 11 localities (table 5) reported no chronic bronchitis at all; 3 of the 6 reported some acute bronchitis and some emphysema; 2 reported no bronchitis or emphysema. Since, in the absence of an acute attack, the outstanding sympton of chronic bronchitis is a cough, which may vary with a number of factors including season, it is difficult to obtain a complete record of prevalence particularly by the physical examination method.

Chronic emphysema may usually be recognized by inspection and so is not as readily overlooked as chronic bronchitis. Among Life Extension Institute (*9*) examinations the prevalence of pulmonary emphysema for males 20 years of age and over is 1.0 percent for New York City, 0.4 percent for other cities, and 0.5 percent for agricultural workers. Members of low-income farm families examined by the Farm Security Administration show a prevalence rate of 3.4 percent for males 20 years of age and over. At 55 years of age and over, 11.8 percent of males examined by the Farm Security Administration showed signs of having chronic emphysema. The relative age-specific prevalence of chronic emphysema is shown in figure 4.

Sinusitis.—In Farm Security Administration examinations each recorded case of sinusitis was diagnosed by the examining physician as present at the time of examination. However, a complete record of the method of examination was not kept; transillumination of the sinuses was done routinely in some localities, although probably not in all; X-ray of the sinuses was not done in any of the localities.

The prevalence of sinusitis shows a marked association with geographic section (table 5); the more southern localities have prevalence rates for whites of 1 percent or less compared with an average rate of 5.5 percent for the 11 localities combined. Prevalence rates of sinusitis found for members of Farm Security Administration borrower

[3] Unpublished data.

families in northern localities and for members of Baltimore families and students participating in the John J. Abel research on the common cold (*4*) examined both by transillumination and by X-ray are shown in the following table:

Age	Farm Security Administration [1] — sinusitis (acute and chronic)		Baltimore [2]—sinuses cloudy	
	Actual	Adjusted [3]	By transillumination	By X-ray
	Percent			
Under 15	2.29	1.46	4.8	31.2
15 and over	19.03	18.18	10.7	16.8

[1] The localities included are: North.—Aroostook County, Maine, Champaign County, Ohio, Montgomery County, Ind., and Callaway County, Mo.
[2] From Gafafer (4) 1928–30.
[3] Adjusted to the age distribution of the examined members of Baltimore families and students.

The recorded prevalence of sinusitis in Baltimore is somewhat lower than that for northern Farm Security Administration borrower families. Since the Baltimore-examined population was heavily weighted by students 20 to 29 years of age, when sinusitis rates have not reached their peak, the actual rates of the Farm Security Administration have been adjusted to the age distribution of the examined Baltimore population. This age adjustment lowers the actual Farm Security Administration rates somewhat; the age adjusted prevalence for 15 years and over in northern localities, however, remains significantly higher than the rates for Baltimore, where examination was by transillumination of the sinuses. The Life Extension Institute (*9*) examinations give prevalence rates of 0.6 percent for New York City, 0.3 percent for other cities; and 0.3 percent for agricultural workers 20 years and over; or prevalence rates which are approximately one-thirtieth of the low-income farm prevalence (10.2 percent for males 20 years and over). Among a group of medical officers of the United States Army, Navy, and Public Health Service and College faculty members and their families (*11*) 5.6 percent 20 years and over stated that they had had sinusitis at some time prior to being questioned.[3] Although the recorded prevalence of sinusitis is somewhat high for members of low-income farm families, compared with other available data, it is difficult to say to what extent the difference might be due to such factors as locality or method of examination. Age-specific prevalence of sinusitis (fig. 4) shows that the rates increase rapidly up to 20 years of age, continue to increase slowly until 50 years, and decline slowly thereafter.

[3] Unpublished data.

SUMMARY

The prevalence of deviated septum and chronic respiratory affections exclusive of diseased tonsils recorded for Farm Security Administration examinations of rural rehabilitation farmers and their families is presented and compared with available data.

Slight as well as marked deviations of the nasal septum have been included in the records although the extent of the deviation recorded obviously varies with individual medical examiners. The actual prevalence of deviated septum among members of Farm Security Administration borrower families in a total of 19 localities is approximately 40 percent for persons (both sexes) over 20 years of age, or considerably lower than that recorded for examinations made in New York City (male) and Baltimore (both sexes) which showed a prevalence of approximately 70 percent; for members of Farm Security Administration borrower families, however, a prevalence of 75 or 80 percent was recorded for some individual localities. The relative age prevalence of deviated septum in these data is similar to that reported elsewhere; there is a rapid rate of increase in the rates up to 30 years of age and a constant rate thereafter. A higher prevalence of deviated septum was recorded for males than females; and also a higher rate among whites than Negroes.

Among the chronic affections of the respiratory system here dealt with, the reported prevalence of hay fever and chronic bronchitis are thought to be little more than a record of attacks of chronic diseases present at the time of examination. Asthma and chronic bronchitis and emphysema are recorded as five or more times as frequent among males as females. The prevalence of asthma among low-income farmers is not greatly different from that recorded for other groups. At ages over 55 years 12 percent of white males showed signs of chronic pulmonary emphysema, which is a significantly higher prevalence than the Life Extension Institute records for either urban or agricultural groups. Sinusitis prevalence shows a definite association with geographic section, the North having the higher rates. The recorded prevalence of sinusitis is somewhat high among members of low-income farm families compared with available data for other groups, but it is difficult to say to what extent the prevalence of sinusitis is influenced by such factors as climate.

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THE EFFECT OF TOPICALLY APPLIED SODIUM FLUORIDE ON DENTAL CARIES EXPERIENCE. II. REPORT OF FINDINGS FOR SECOND STUDY YEAR [1] [2]

By John W. Knutson, *Dental Surgeon, United States Public Health Service*, and Wallace D. Armstrong, *Professor of Physiological Chemistry, University of Minnesota*

In a previous report (*1*) data were presented for the year ending May 1943 on the incidence of dental caries in the permanent teeth of 2 groups of children. The 289 children in the first of these groups received 7 to 15 topical applications of 2-percent sodium fluoride solution to the teeth in the upper left and lower left quadrants of the mouth. The second group, consisting of 326 control children, did not receive the fluoride treatments. Analysis of the data indicated (1) the number of previously undecayed teeth attacked by caries during the study year was approximately 40 percent less in fluoride-treated than in untreated teeth, and (2) the number of additional tooth surfaces attacked in previously decayed teeth was less but not significantly less in treated than in untreated carious teeth.

[1] From the States Relations Division, U. S. Public Health Service, Washington, D. C., in cooperation with the Minnesota Department of Health, Minneapolis, Minn., and the Laboratory of Dental Research and Division of Physiological Chemistry, University of Minnesota, Minneapolis, Minn.

[2] The Council on Dental Therapeutics of the American Dental Association and the American College of Dentists furnished grants which were used to defray part of the expenses of this investigation.

It is the purpose of this report to present data on the dental caries experience in the permanent teeth of these two groups of children for the second study year and for the 2-year period ending May 1944. Briefly, analysis of the data indicates that during both these time periods initial caries attack on fluoride-treated teeth continued to be approximately 40 percent less than on untreated teeth. Furthermore, the number of additional tooth surfaces attacked in previously decayed teeth not only continued to be less in treated than in untreated carious teeth but the magnitude of the difference was appreciably increased during the second year.

MATERIAL AND METHODS

The children participating in this study comprise a part of the school populations of North Mankato, Arlington, and St. Louis Park, 3 small urban centers in Minnesota. The ages of the children at the time the study was begun varied from 7 to 15 years. The treated group, originally consisting of 337 children, received topical fluoride applications to the teeth in the left quadrants of the mouth. The teeth in the right or untreated mouth quadrants served as direct controls. An additional group of children, originally consisting of 392 children enrolled in the same schools as the treated children, did not receive fluoride treatments and served as additional controls.

During an 8-week period in April and May 1942, each child in the study groups received a dental prophylaxis and a detailed dental examination. In addition the children in the treated group received 7 to 15 topical applications of fluoride to the teeth in the left quadrants of the mouth. The fluoride treatment procedure consisted of isolation of the teeth with cotton rolls, drying the teeth with compressed air, and wetting the crown surfaces of the teeth with 2-percent sodium fluoride solution. The applied solution was allowed to dry in air for approximately 4 minutes. During the 8-week treatment period, roughly two-thirds of the children in the treated group received 2 fluoride applications weekly to a maximum of 15 and the remaining third received 1 application weekly to a maximum of 8 treatments.

The fluoride treatments were completed in May 1942. At yearly intervals thereafter, the teeth of the children in both the treated and control groups have been re-examined. All dental examinations have been made by one of us (J. W. K.). The treated and control children in any one school were randomly examined. Variations in the numbers of children in each study group are due to changes in residence, absence from school at the time re-examinations were conducted or discontinuance of attendance at school. The analysis, throughout, is confined to the dental caries experience in the erupted permanent teeth present at the beginning of the study.

FINDINGS

The caries experience in the permanent teeth of the treated group of children for the 2-year period ending May 1944 is presented, by mouth quadrants, in table 1. Caries experience is expressed in terms of numbers of teeth and tooth surfaces initially attacked during this time period and numbers of additional tooth surfaces attacked in teeth which were carious at the time the first dental examination was made.

TABLE 1.—*Treated group. Dental caries experience during the 2-year period ending May 1944, for the permanent teeth in the fluorine-treated and untreated quadrants of the jaws of 270 Minnesota children*

Quadrant	Number of noncarious teeth (April 1942)	New DF[1] teeth (May 1944)	DF surfaces in new DF teeth	New DF surfaces in previously carious teeth	Total new DF surfaces
	Upper				
Treated (left)	929	97	115	94	209
Untreated (right)	940	173	214	120	334
	Lower				
Treated (left)	1145	67	83	89	172
Untreated (right)	1154	107	131	118	249

[1] DF—Carious (decayed or filled).

According to the data in table 1, only 97 teeth became carious in the upper left or fluoride-treated quadrant whereas 173 teeth became carious in the upper right or untreated quadrant. For the teeth in the lower mouth quadrants, 67 became carious in the left and 107 in the right quadrant. The total number of new carious teeth in both treated quadrants is 164 and for both untreated quadrants is 280. This is a gross difference of 41.4 percent less teeth attacked by caries in the treated than in the untreated teeth and compares closely with the 39.8 percent difference reported (*1*) for the year ending May 1943.

Comparison of the number of tooth surfaces attacked by caries in teeth which were noncarious at the time of treatment (table 1) yields results closely in accord with the results of the foregoing comparisons made on the basis of new carious teeth.

Continuing the examination of the data in table 1, the numbers of tooth surfaces which became carious in previously carious teeth are appreciably less in the treated quadrants than in the untreated quadrants—94 in the treated and 120 in the untreated upper teeth, and 89 in the treated and 118 in the untreated lower teeth. These particular findings indicate that the fluoride treatment of carious teeth reduces attack on additional surfaces approximately 20 percent.

In general the findings for the 2-year period of observations are in accord with the findings reported (*1*) for the first year. The only notable difference is an appreciable increase in the difference between the number of additional tooth surfaces attacked in treated as compared with untreated teeth which were carious at the time the study was begun. It is apparent therefore that the caries-inhibiting effect of the topical fluorides is fully as effective during the second year following treatment as during the first year. A direct check on this conclusion is afforded by a separate analysis of the data on the caries experience in the teeth of the treated group for the second year.

TABLE 2.—*Treated group. Dental caries experience during the year ending May 1944, for the permanent teeth in the fluorine-treated and untreated quadrants of the jaws of 260 Minnesota children.*

Quadrant	Number of noncarious teeth (May 1943)	New DF[1] teeth (May 1944)	DF surfaces in new DF teeth	New DF surfaces in previously carious teeth	Total new DF surfaces
	Upper				
Treated (left)	842	43	48	70	108
Untreated (right)	816	83	100	86	186
	Lower				
Treated (left)	1,061	27	30	40	70
Untreated (right)	1,055	48	55	61	116

[1] DF—Carious (decayed or filled).

The numbers of permanent teeth that were noncarious in May 1943 and the number of these that became carious during the year ending May 1944 are presented for the treated group of children in table 2. The caries experience in terms of tooth surfaces is also given. According to these data, 43 teeth in the upper left or treated quadrant and 83 in the upper right or untreated quadrant were initially attacked by caries during this particular year, a difference of 48.2 percent less caries in the treated than in the untreated upper teeth. In the lower jaw 27 teeth in the left and 48 in the right quadrant became carious, a difference of 43.8 percent. These differences are slightly greater than those observed for either the 2-year period ending May 1944 (table 1) or those observed for the first study year (*1*) and confirm the conclusion that the flouride treatment is fully as effective during the second year as during the first year following treatment.

A summary of the percentages by which the caries experience in the fluoride-treated teeth was lower than that observed in untreated teeth is presented in table 3 for the separate time periods of the study.

Inasmuch as the control aspect of this study is based on the bilaterally equal occurrence of dental caries usually observed in popu-

lation groups, it becomes important to check this characteristic in the control group of children. The dental caries experience in the teeth of the control group of children is presented in table 4. Examination of the data in this table shows that 253 teeth in the upper left and 254 in the upper right quadrant were attacked by caries. In the lower jaw, 137 teeth in the left and 137 in the right quadrant became carious. These findings are remarkably in agreement with the observed phenomenon that caries normally occurs bilaterally equal in population groups.

TABLE 3.—*Treated group. Percent less new caries experience in the fluoride-treated jaw quadrants (left) than in the untreated quadrants (right) of a selected group of Minnesota children*

Year	Upper jaw	Lower jaw	Both jaws
	Percent less new carious teeth		
1942–43	46.0	30.3	39.8
1943–44	48.2	43.8	46.6
1942–44	43.9	37.4	41.4
	Percent less new carious surfaces in previously decayed teeth		
1942–43	14.0	11.1	12.4
1943–44	18.6	34.4	25.2
1942–44	21.7	24.6	23.1

TABLE 4.—*Control group. Dental caries experience during the 2-year period ending May 1944, for the permanent teeth in the left and right quadrants of the jaws of 320 Minnesota children*

Quadrant	Number of noncarious teeth (April 1942)	New DF [1] teeth (May 1944)	DF surfaces in new DF teeth	New DF surfaces in previously carious teeth	Total new DF surfaces
	Upper				
Left	1,322	253	332	172	504
Right	1,317	254	339	193	532
	Lower				
Left	1,465	137	180	191	371
Right	1,489	137	199	188	387

[1] DF—Carious (decayed or filled).

SUMMARY

Data on the incidence of dental caries in the permanent teeth of a treated group of children and a control group of children for the second year of a longitudinal study have been presented and analyzed. The data for the first study year have been reported previously. During an 8-week period, April and May 1942, the children in the treated group received 7 to 15 topical applications of sodium fluoride

solution to the teeth in the left quadrants of the mouth. Analysis of the data indicates:

1. During the 2-year period ending May 1944, 41.3 percent less teeth became carious of the fluoride-treated than of the untreated teeth of the treated group of children. The number of additional tooth surfaces which became decayed in teeth which were carious at the beginning of the study was 23.1 percent less in treated than in untreated carious teeth.
2. During the second study year, the year ending May 1944, 46.6 percent less treated teeth became carious than untreated teeth. The number of additional surfaces which became decayed in previously carious teeth was 25.2 percent less in treated than in untreated carious teeth.
3. By and large the findings confirm those reported for the first study year. In addition it is indicated that the fluoride treatments are fully as effective in inhibiting dental caries during the second year following treatment as during the first year. Further, the evidence suggests that the treatment of carious teeth reduces approximately 20 percent the liability to attack on additional surfaces.
4. The incidence of caries in the permanent teeth of the control group of children, by mouth quadrants, was strikingly similar in the two upper quadrants and also in the two lower mouth quadrants.

The foregoing results of this initial or pilot study on the caries-inhibiting effect of topically applied fluorides are sufficiently encouraging to justify additional and more stringently controlled studies. One such study designed to test the relative effectiveness of different numbers of treatments is now in progress and plans for conducting others are being made.

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INCIDENCE OF HOSPITALIZATION, JULY 1945

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	July	
	1944	1945
1. Number of plans supplying data	73	79
2. Number of persons eligible for hospital care	13, 664, 738	18, 044, 754
3. Number of persons admitted for hospital care	129, 769	179, 472
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	112. 2	117. 7
5. Incidence per 1,000 persons, annual rate for the 12 months ended July 31, 1945	105. 2	105. 5
6. Number of plans reporting on hospital days	20	32
7. Days of hospital care per case discharged during month [1]	6. 95	7. 12

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED AUGUST 25, 1945

Summary

The total of 931 cases of poliomyelitis reported, as compared with 694 last week, represents an increase of 237 cases—the largest numerical weekly increase this year. For the corresponding week last year 1,530 cases were reported, representing an increase of 276 cases for the week. The corresponding 5-year (1940–44) median is 623. Increases occurred in all geographic areas except the East South Central and the Pacific. The largest increases were reported in the Middle Atlantic and East North Central groups, where 57 percent of the total for the week occurred. Increases occurred in all but 5 of the 22 States reporting 10 or more cases each. They are as follows (last week's figures in parentheses): *Increases*—Massachusetts 37 (22), Connecticut 16 (13), New York 191 (110), New Jersey 88 (72), Pennsylvania 65 (50), Ohio 30 (15), Illinois 121 (77), Michigan 13 (10), Wisconsin 15 (3), Minnesota 14 (9), Iowa 19 (7), District of Columbia 17 (12), North Carolina 11 (6), South Carolina 17 (11), Texas 73 (55), Colorado 12 (7), Utah 14 (8); *decreases*—Indiana 10 (16), Virginia 20 (25), Tennessee 24 (36), Washington 16 (22), California 24 (25).

Since June 30 of this year, 3,938 cases have been reported, as compared with 6,790 and 3,846, respectively, for the corresponding periods of 1944 and 1943. The total to date is 5,209, as compared with 7,792 last year, 4,930 in 1943, and a 5-year median for the period of 3,438.

Of the total of 91 cases of meningococcus meningitis reported, as compared with 159 for the corresponding week last year and a 5-year median of 58, only 4 States reported more than 6 cases each. The total to date this year is 6,267, as compared with 13,248 for the corresponding period last year, and a 5-year median of 2,454.

Of 508 reported cases of dysentery, undefined, Virginia reported 431. Of the total of 665 cases of bacillary dysentery, Texas reported 467, Arkansas 59, Connecticut 43, and South Carolina 41. To date this year a total of 24,532 cases of dysentery, all forms, has been reported, as compared with 21,105 for the same period last year.

A total of 8,557 deaths was recorded for the week in 93 large cities of the United States, as compared with 7,642 last week, 7,472 for the corresponding week last year, and a 3-year (1942–44) average of 7,602. The total to date this year is 308,436, as compared with 312,399 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended August 25, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 25, 1945	Aug. 26, 1944		Aug. 25, 1945	Aug 26, 1944		Aug. 25, 1945	Aug. 26, 1944		Aug. 25, 1945	Aug. 26, 1944	
NEW ENGLAND												
Maine	0	0	0	------	2	------	1	5	5	0	0	0
New Hampshire	0	0	0	------	------	------	0	2	2	1	0	0
Vermont	0	0	0	------	------	------	2	5	5	1	0	0
Massachusetts	2	1	2	------	------	------	48	40	55	0	4	4
Rhode Island	0	1	0	30	------	------	0	0	4	0	0	0
Connecticut	0	0	0	------	------	------	5	18	11	0	2	1
MIDDLE ATLANTIC												
New York	13	5	7	[1] 1	([1])	([1])	26	51	90	12	31	6
New Jersey	2	0	1	2	2	2	11	21	36	2	7	5
Pennsylvania	6	6	6	------	3	------	22	22	24	6	11	6
EAST NORTH CENTRAL												
Ohio	5	9	6	------	3	3	5	5	18	6	5	2
Indiana	4	3	3	3	4	4	4	4	4	0	3	2
Illinois	2	3	8	------	5	2	58	14	24	10	13	3
Michigan [2]	6	8	5	------	1	1	30	32	35	3	4	2
Wisconsin	0	6	2	11	10	10	83	51	76	6	4	1
WEST NORTH CENTRAL												
Minnesota	7	2	2	------	------	1	2	6	6	1	2	0
Iowa	1	0	4	------	------	------	2	3	5	2	3	2
Missouri	1	2	2	------	2	1	4	4	7	2	10	2
North Dakota	5	0	0	4	------	------	3	1	1	0	0	0
South Dakota	2	0	2	------	------	------	0	1	2	0	0	0
Nebraska	4	1	1	------	15	2	2	1	1	0	1	0
Kansas	10	1	2	------	------	2	5	11	11	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	1	0	0	0	0
Maryland [2]	10	3	3	------	1	3	1	4	4	1	1	2
District of Columbia	0	0	0	------	------	------	0	1	2	0	0	0
Virginia	7	8	9	147	47	58	6	5	22	3	1	1
West Virginia	5	4	4	------	------	1	0	1	1	0	0	1
North Carolina	33	16	16	------	------	------	1	20	14	5	2	0
South Carolina	15	11	11	101	86	117	7	10	14	1	3	0
Georgia	22	7	10	2	7	7	2	3	3	0	3	0
Florida	2	12	2	1	1	2	3	72	2	0	1	0
EAST SOUTH CENTRAL												
Kentucky	12	7	6	------	2	------	10	2	6	0	1	0
Tennessee	6	6	6	5	3	8	1	4	5	2	6	1
Alabama	26	31	14	24	2	4	1	7	7	3	10	2
Mississippi [2]	11	5	5	------	------	------	------	------	------	2	3	0
WEST SOUTH CENTRAL												
Arkansas	2	5	7	4	10	2	2	6	8	2	0	0
Louisiana	5	5	5	15	------	1	1	0	1	1	2	0
Oklahoma	4	1	2	12	------	6	3	0	4	0	0	0
Texas	56	18	18	522	251	250	44	33	33	9	8	2
MOUNTAIN												
Montana	0	0	1	------	10	------	2	1	5	0	0	0
Idaho	0	0	0	1	------	------	14	0	0	0	0	0
Wyoming	0	0	0	------	------	------	3	0	3	0	0	0
Colorado	3	9	7	18	2	5	6	1	8	2	1	0
New Mexico	7	7	1	------	1	------	0	1	2	0	0	0
Arizona	2	1	0	17	19	19	4	8	11	0	1	0
Utah [2]	1	0	0	------	1	------	50	5	6	0	0	0
Nevada	0	0	0	------	------	------	0	0	0	0	0	0
PACIFIC												
Washington	4	0	0	------	2	------	42	19	19	0	6	1
Oregon	3	2	2	1	1	3	5	46	15	0	2	1
California	12	18	8	8	7	13	129	149	101	8	7	3
Total	318	224	218	929	500	500	650	696	879	91	159	58
34 weeks	[3] 8,610	7,007	7,623	71,661	339,178	169,606	[3] 101,897	591,654	538,338	[3] 6,267	13,248	2,454

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Corrected cumulative total.

Telegraphic morbidity reports from State health officers for the week ended August 25, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Aug. 25, 1945	Aug. 26, 1944		Aug. 25, 1945	Aug. 26, 1944		Aug. 25, 1945	Aug. 26, 1944		Aug. 25, 1945	Aug. 26, 1944	
NEW ENGLAND												
Maine	4	2	2	18	4	4	0	0	0	2	2	0
New Hampshire	4	8	0	8	2	2	0	0	0	0	0	0
Vermont	1	2	1	4	0	1	0	0	0	0	0	0
Massachusetts	37	43	8	35	41	36	0	0	0	8	8	5
Rhode Island	0	1	1	4	2	2	0	0	0	1	0	0
Connecticut	16	19	7	6	10	5	0	0	0	2	0	1
MIDDLE ATLANTIC												
New York	191	581	42	78	37	46	0	0	0	13	15	15
New Jersey	88	36	25	22	8	15	0	0	0	9	0	4
Pennsylvania	65	139	9	34	30	30	0	0	0	7	11	15
EAST NORTH CENTRAL												
Ohio	30	97	44	55	51	51	0	0	0	1	7	7
Indiana	10	16	16	14	9	9	0	0	0	1	1	2
Illinois	121	38	23	52	32	37	0	0	0	7	4	9
Michigan [2]	13	94	11	69	30	27	2	0	0	3	3	4
Wisconsin	15	26	8	30	23	28	0	0	0	2	1	0
WEST NORTH CENTRAL												
Minnesota	14	57	10	19	20	14	0	0	0	0	0	0
Iowa	19	15	13	9	14	9	0	0	0	13	3	3
Missouri	8	10	10	15	8	8	0	0	0	0	7	10
North Dakota	0	7	2	8	0	0	0	0	0	1	0	0
South Dakota	0	0	0	2	2	2	0	0	0	0	0	0
Nebraska	5	9	9	8	1	3	2	1	0	0	0	0
Kansas	3	6	6	16	9	16	0	0	0	0	4	4
SOUTH ATLANTIC												
Delaware	1	5	1	0	3	2	0	0	0	0	1	1
Maryland [2]	9	40	3	11	9	9	0	0	0	0	3	6
District of Columbia	17	27	1	10	2	3	0	0	0	1	2	2
Virginia	20	63	6	29	18	12	0	0	0	4	4	8
West Virginia	7	17	4	28	24	20	0	0	0	2	5	6
North Carolina	11	46	4	35	30	22	0	0	0	3	3	8
South Carolina	17	5	4	8	4	5	0	0	0	5	3	5
Georgia	2	7	1	8	7	7	0	0	0	9	8	15
Florida	2	4	2	3	3	3	0	0	0	4	2	3
EAST SOUTH CENTRAL												
Kentucky	4	38	18	22	6	17	1	0	0	5	8	11
Tennessee	24	9	9	22	15	14	0	0	0	15	5	6
Alabama	5	7	5	9	13	14	0	1	0	8		6
Mississippi [2]	4	2	2	5	6	6	0	1	0	3		6
WEST SOUTH CENTRAL												
Arkansas	2	1	1	5	6	3	0	2	0	[5] 3	3	12
Louisiana	4	2	2	5	5	3	0	0	0	2	7	7
Oklahoma	7	1	1	5	3	4	0	0	0	4	10	10
Texas	73	7	7	32	21	18	0	0	0	33	30	30
MOUNTAIN												
Montana	1	2	0	4	9	9	0	0	0	3	0	0
Idaho	0	0	0	3	7	2	0	0	0	0	2	1
Wyoming	2	2	1	1	4	2	0	0	0	0	0	0
Colorado	12	7	2	5	3	6	0	0	0	1	2	2
New Mexico	3	2	2	3	3	2	0	0	0	1	5	4
Arizona	3	0	1	0	2	1	0	0	0	3	4	1
Utah [2]	14	3	3	7	11	2	0	0	0	2	1	1
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	16	5	5	9	26	10	0	0	0	0	1	0
Oregon	3	12	3	5	14	11	0	0	0	2	3	2
California	24	10	13	85	60	45	0	0	0	1	4	4
Total	931	1,530	623	865	647	588	5	5	3	184	190	242
34 weeks	5,209	7,792	3,438	135,413	148,239	98,496	270	305	614	[5] 2,918	3,447	4,267

[2] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately, as follows: Massachusetts 7; New York 4; New Jersey 1; Georgia 1; Texas 6; Arizona 1.
[5] Correction: Arkansas, week ended August 4, typhoid fever 5 cases (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended August 25, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended August 25, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Aug. 25, 1945	Aug. 26, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	34	9	13	0	0	0	0	0	0	0	0
New Hampshire	0	3	1	0	0	0	0	0	0	0	1
Vermont	20	24	14	0	0	0	0	0	0	0	1
Massachusetts	131	43	116	3	2	0	0	0	0	0	3
Rhode Island	9	1	13	0	0	0	1	0	0	0	0
Connecticut	28	70	44	0	43	0	0	0	0	0	3
MIDDLE ATLANTIC											
New York	417	166	247	1	8	0	3	1	0	2	1
New Jersey	196	66	116	1	0	0	0	0	0	1	1
Pennsylvania	173	59	199	1	0	0	0	0	0	0	3
EAST NORTH CENTRAL											
Ohio	158	130	192	0	0	0	0	0	0	0	2
Indiana	28	3	18	0	0	0	1	3	0	0	0
Illinois	99	88	156	8	1	0	0	0	0	0	2
Michigan [3]	170	107	215	3	2	0	0	0	0	0	5
Wisconsin	72	110	208	1	0	0	0	0	1	0	4
WEST NORTH CENTRAL											
Minnesota	27	39	44	0	0	0	0	0	0	0	3
Iowa	9	1	22	0	0	0	0	0	0	0	6
Missouri	29	26	20	0	0	1	0	0	0	0	1
North Dakota	2	12	18	1	0	0	1	0	0	0	5
South Dakota	1	7	6	0	0	0	0	0	0	0	1
Nebraska	0	3	4	0	0	0	0	0	0	0	1
Kansas	18	34	45	0	0	0	1	0	0	0	5
SOUTH ATLANTIC											
Delaware	3	3	1	0	0	0	0	2	0	0	0
Maryland [3]	63	61	61	0	0	3	0	[6] 2	0	0	0
District of Columbia	15	2	11	0	0	0	0	0	0	0	0
Virginia	51	39	57	0	0	431	0	4	0	0	0
West Virginia	4	13	13	0	0	0	0	2	0	0	0
North Carolina	75	117	107	1	0	0	0	3	0	5	0
South Carolina	95	31	31	2	41	0	0	0	0	12	0
Georgia	16	8	19	1	10	1	0	0	0	43	5
Florida	2	2	4	0	0	0	0	0	0	10	0
EAST SOUTH CENTRAL											
Kentucky	23	50	51	0	1	0	0	3	1	0	0
Tennessee	22	40	37	1	0	1	0	1	0	2	0
Alabama	19	15	15	5	0	0	1	2	1	35	5
Mississippi [3]	------	------	------	0	0	0	0	0	0	12	0
WEST SOUTH CENTRAL											
Arkansas	6	15	15	0	59	0	0	0	0	1	2
Louisiana	8	11	11	3	0	0	0	0	0	16	0
Oklahoma	7	3	4	1	16	0	0	0	0	0	1
Texas	235	165	136	10	467	26	0	0	0	82	6
MOUNTAIN											
Montana	7	25	21	0	3	1	0	0	0	0	0
Idaho	8	17	8	0	0	1	0	0	0	0	0
Wyoming	4	5	4	0	0	0	0	0	4	0	0
Colorado	44	11	29	0	0	0	0	0	0	0	0
New Mexico	11	0	14	0	6	1	0	0	0	0	0
Arizona	11	70	13	0	0	42	0	0	0	0	0
Utah [3]	35	23	26	0	0	0	0	1	0	0	1
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	17	11	23	1	0	0	0	0	0	0	0
Oregon	5	8	17	0	0	0	0	0	0	0	0
California	144	60	165	2	6	0	15	0	0	1	3
Total	2,551	1,806	2,965	46	665	508	23	22	7	222	71
Same week, 1944	1,806	------	------	29	549	238	29	16	7	205	78
Average, 1942–44	2,517	------	------	35	397	271	23	[7] 16	15	[7] 139	------
34 weeks, 1945	86,745	------	------	1,229	16,660	6,643	302	372	526	2,899	3,181
1944	64,958	------	------	1,140	14,543	5,422	401	381	386	2,934	2,407
Average, 1942–44	108,333	------	[7] 125,149	1,095	10,345	4,980	397	[7] 381	554	[7] 1,972	------

[3] Period ended earlier than Saturday. [6] June cases, delayed report. [7] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 18, 1945

This table lists the reports from 86 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	2	2	3	0	0	6
New Hampshire:												
Concord	0	0	------	0	0	0	1	0	1	0	0	0
Massachusetts:												
Boston	1	0	------	0	16	1	7	20	11	0	2	32
Springfield	0	0	------	0	3	0	0	1	1	0	1	3
Worcester	0	0	------	0	14	0	6	0	3	0	0	1
Rhode Island:												
Providence	0	1	1	0	0	0	0	0	1	0	0	7
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	1	0	0	0	1
Hartford	0	0	------	0	0	0	2	0	0	0	0	0
New Haven	0	0	------	0	0	0	0	0	0	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	1	0	3	7	3	0	0	3
New York	4	1	------	0	9	8	27	38	18	0	2	93
Rochester	0	0	------	0	0	0	2	16	1	0	0	14
Syracuse	0	0	------	0	0	0	0	0	1	0	0	25
New Jersey:												
Camden	0	0	------	0	0	0	0	0	5	0	0	1
Newark	0	0	1	0	1	0	1	4	1	0	9	10
Trenton	0	0	------	0	0	0	0	11	0	0	0	9
Pennsylvania:												
Philadelphia	0	0	1	0	14	1	8	18	14	0	5	94
Pittsburgh	0	2	------	0	0	1	4	2	2	0	1	12
Reading	0	0	------	0	0	0	0	1	1	0	1	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	0	3	2	1	3	7	0	0	4
Cleveland	0	0	1	0	1	1	6	0	6	0	0	20
Columbus	0	0	------	0	1	0	0	2	5	0	0	1
Indiana:												
Fort Wayne	0	0	------	0	0	0	0	0	1	0	0	1
Indianapolis	0	0	------	0	3	1	1	1	2	0	0	7
South Bend	0	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	0	1
Illinois:												
Chicago	1	0	------	0	33	6	14	11	11	0	1	72
Springfield	0	0	------	0	0	0	0	0	0	0	0	0
Michigan:												
Detroit	4	1	------	0	12	1	6	3	10	0	0	51
Flint	0	0	------	0	1	0	2	0	3	0	0	0
Grand Rapids	0	0	------	0	0	0	1	0	2	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	1	0	0	3
Milwaukee	0	0	------	0	5	1	0	6	3	0	0	7
Racine	0	0	------	0	2	0	1	0	1	0	0	0
Superior	0	0	------	0	0	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	1	0	0	0	0	0	0
Minneapolis	0	0	------	0	0	0	1	8	2	0	0	0
St. Paul	0	0	------	0	1	2	1	0	0	0	0	2
Missouri;												
Kansas City	0	0	------	0	0	0	6	0	1	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	0	0	0	0
St. Louis	0	0	------	0	6	1	4	7	1	0	1	18

City reports for week ended August 18, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	0	0	0	0	0	0	0	0
Nebraska:												
Omaha	0	0	------	0	0	0	2	1	0	0	0	0
Kansas:												
Topeka	1	0	------	0	1	0	2	0	0	0	0	0
Wichita	1	0	------	0	0	0	2	0	1	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	0	0	0	0	0	3
Maryland:												
Baltimore	6	0	------	0	1	2	3	2	8	0	0	34
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	1	4	12	3	0	0	8
Virginia:												
Lynchburg	0	0	------	0	0	0	1	0	0	0	0	0
Richmond	0	0	------	0	0	0	0	10	1	0	1	1
Roanoke	0	0	------	0	0	0	0	0	1	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	1	1	0	1	0
Wheeling	0	0	------	0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	1	0	0	4
Wilmington	1	0	------	0	0	1	0	0	3	0	0	6
Winston-Salem	0	0	------	0	0	0	0	0	2	0	0	13
South Carolina:												
Charleston	1	0	------	0	0	0	0	2	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	0	1	0	0	1	1
Brunswick	0	0	------	0	1	0	0	0	1	0	0	0
Savannah	0	0	------	0	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	1	3	3	0	0	0	7
Nashville	0	0	------	0	0	0	2	1	0	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	0	1	7	1	0	0	1
Mobile	0	0	------	0	0	0	2	0	0	0	1	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	0	0	0	0	0	0
Louisiana:												
New Orleans	3	0	2	2	3	2	4	3	4	0	0	0
Shreveport	0	0	------	0	0	0	3	1	0	0	0	0
Texas:												
Dallas	2	0	------	0	0	0	2	5	3	0	0	3
Galveston	1	0	------	0	0	0	0	1	0	0	0	1
Houston	2	0	------	0	0	1	2	9	2	0	2	2
San Antonio	3	0	------	0	1	0	3	3	0	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	0	0	0	0	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	1	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	2	0	0	0	3	7	2	0	0	15
Pueblo	3	0	------	0	0	0	1	0	1	0	0	1
Utah:												
Salt Lake City	0	0	------	0	5	0	3	4	0	0	0	7

City reports for week ended August 18, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	12	0	4	4	2	0	0	3
Spokane	0	0	------	0	0	0	2	0	1	0	0	0
Tacoma	1	0	------	0	10	1	0	0	0	0	0	1
California:												
Sacramento	0	0	------	0	0	0	0	0	1	0	0	8
San Francisco	1	0	1	0	13	2	4	2	12	0	2	2
Total	37	5	9	2	174	38	163	241	174	0	31	630
Corresponding week, 1944	29	------	18	8	184	------	268	------	132	0	34	552
Average, 1940–44	36	------	20	[1] 7	[2] 257	------	[1] 224	------	178	0	39	979

[1] 3-year average 1942–44.
[2] 5-year median 1940–44.

Dysentery, amebic.—Cases: New York, 5; Chicago, 2; Detroit, 4; St. Louis, 2.

Dysentery, bacillary.—Cases: Boston, 1; Providence, 4; Buffalo, 1; New York, 3; Rochester, 1; Detroit, 2; St. Louis, 1; Atlanta, 4.

Dysentery, unspecified.—Cases: Washington, 1; Richmond, 1; San Antonio, 6.

Typhus fever, endemic.—Cases: Atlanta, 1; Savannah, 7; New Orleans, 3; Shreveport, 6; Houston, 3; San Antonio, 9.

Rates (annual basis) per 100,000 population, by geographic groups, for the 86 cities in the preceding table (estimated population, 1943, 32,454,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.8	2.8	2.8	0.0	92	2.8	50.0	66.6	56	0.0	8.3	150
Middle Atlantic	2.3	1.4	0.9	0.0	12	4.6	20.8	44.9	21	0.0	8.3	122
East North Central	3.0	0.6	0.6	0.0	37	7.3	19.5	15.8	32	0.0	0.6	103
West North Central	4.0	0.0	0.0	0.0	18	8.0	35.8	31.8	10	0.0	2.0	42
South Atlantic	13.6	0.0	0.0	0.0	3	6.8	15.3	47.5	37	0.0	5.1	119
East South Central	0.0	0.0	0.0	0.0	0	5.9	47.2	64.9	6	0.0	5.9	47
West South Central	31.6	0.0	5.7	5.7	11	8.6	40.2	63.1	26	0.0	5.7	20
Mountain	23.8	0.0	15.9	0.0	40	0.0	71.5	87.4	24	0.0	0.0	183
Pacific	6.5	0.0	3.3	0.0	114	9.8	32.6	19.6	52	0.0	6.5	46
Total	6.0	0.8	1.4	0.3	28	6.1	26.3	38.8	28	0.0	5.0	101

PLAGUE INFECTION IN KERN COUNTY, CALIF., MORTON COUNTY, KANS., AND LARAMIE COUNTY, WYO.

Under date of August 9, plague infection was reported proved, on August 7, in a pool of 185 fleas from 4 ground squirrels, *C. beecheyi*, shot on the east side of Castair Lake, 1½ miles east and ½ mile south of Lebec, Kern County, Calif. Also, in an additional pool of 200 fleas from the same 35 ground squirrels, *C. beecheyi*, previously reported shot 1½ miles east and ½ mile north of Lebec.

Plague infection has been reported to have been proved on August 17 in a pool of 43 fleas from 83 mice, *Peromyscus* sp., and another pool of 52 fleas from 6 rats, *Neotoma* sp., collected, respectively, on July 22 and 24 and July 21 and 24, in Morton County, Kans., 10 miles north of Elkhart on State Highway No. 27, and 5 miles west along river bottom. This location is approximately of the same longitude as that of the locality in Cheyenne County, where plague infection was found on June 23 (Pub. Health Rep., July 20, 1945, p. 849). That was the first instance of plague infection reported in Kansas and the locality is the farthest east in which the infection has been found in wild rodents or their ectoparasites in the United States.

Under date of August 14, plague infection was reported proved, on August 14, in a pool of 33 fleas from 108 ground squirrels, *C. lateralis*, collected July 28 at a location 34 miles west of Cheyenne, Laramie County, Wyo., on U. S. Highway No. 30—Medicine Bow National Forest.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—Plague infection in 3 rats found in District 9A, Paauhau area, Honokaa, Hamakua District, Island of Hawaii, T. H., has been reported as follows: 1 rat found on June 23, 1945, was proved positive on June 28, 1945; 2 rats found on June 26, 1945, were proved positive on July 2, 1945.

DEATHS DURING WEEK ENDED AUGUST 18, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 18, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	7,642	8,681
Average for 3 prior years	8,006	
Total deaths, first 33 weeks of year	299,879	304,927
Deaths under 1 year of age	534	663
Average for 3 prior years	639	
Deaths under 1 year of age, first 33 weeks of year	19,956	20,472
Data from industrial insurance companies:		
Policies in force	67,361,444	66,699,037
Number of death claims	6,181	11,555
Death claims per 1,000 policies in force, annual rate	4.8	9.1
Death claims per 1,000 policies, first 33 weeks of year, annual rate	10.4	10.2

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 4, 1945.—During the week ended August 4, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		19	50	9	3	67	27	176
Diphtheria		2	4	21	1	5	1			34
Dysentery, bacillary				11					2	13
Encephalitis, infectious						1	1			2
German measles				1	7		1	1	4	14
Influenza		1			5				2	8
Measles				14	54	5	8	16	27	124
Mumps		1		2	28	9	9	25	7	81
Poliomyelitis		1		1	6					8
Scarlet fever		3	10	45	25	10	3	5	4	105
Tuberculosis (all forms)		8	10	95	25	22			46	206
Typhoid and paratyphoid fever				15	1	2	1			19
Undulant fever				2	1					3
Venereal diseases:										
Gonorrhea		29	18	65	162	52	35	33	75	469
Syphilis		13	2	144	73	14	6	19	36	307
Whooping cough		2		175	12	3	2	10	5	209

FINLAND

Helsinki—Typhoid fever.—A report dated August 20, 1945, stated that an outbreak of typhoid fever had occurred in Helsinki, Finland. According to press reports there were 650 cases reported as of August 18, and 735 cases as of August 19, 1945. No fatal cases have been reported. It is stated that milk is the principal source of infection.

Notifiable diseases—June 1945.—During the month of June 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	22	Mumps	393
Chickenpox	511	Paratyphoid fever	276
Conjunctivitis	14	Pneumonia (all forms)	1,687
Diphtheria	1,057	Poliomyelitis	35
Dysentery, unspecified	26	Puerperal fever	29
Gastroenteritis	2,748	Rheumatic fever	257
Gonorrhea	1,700	Scabies	2,321
Hepatitis, epidemic	510	Scarlet fever	271
Influenza	349	Syphilis	338
Laryngitis	25	Typhoid fever	58
Malaria	243	Vincent's angina	36
Measles	80	Whooping cough	2,632

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

British East Africa—Kenya.—For the week ended July 28, 1945, 12 cases of plague were reported in Kenya, British East Africa.

Egypt.—For the week ended July 21, 1945, 10 cases of plague with 1 death were reported in all of Egypt. For the week ended August 4, 1945, 2 fatal cases of plague were reported in Port Said, Egypt.

Morocco (French).—For the period August 1–10, 1945, 47 cases of plague were reported in French Morocco, including 46 cases in Chaouia region and 1 in Marrakesh region.

Palestine—Tel-Aviv.—For the week ended August 18, 1945, 1 case of plague was reported in Tel-Aviv, Palestine.

Smallpox

British East Africa—Tanganyika.—For the week ended July 21, 1945, 128 cases of smallpox with 8 deaths were reported in Tanganyika, British East Africa.

Rhodesia, Northern.—For the week ended July 21, 1945, 68 cases of smallpox with 2 deaths were reported in Northern Rhodesia.

Sudan (French).—For the period July 21–31, 1945, 109 cases of smallpox were reported in French Sudan.

Typhus Fever

Egypt.—For the week ended July 21, 1945, 146 cases of typhus fever with 14 deaths were reported in all of Egypt.

Iran.—For the period March 31 to May 11, 1945, 222 cases of typhus fever were reported in Iran, including 30 cases reported in Tehran, Iran.

Morocco (French).—For the period August 1–10, 1945, 309 cases of typhus fever were reported in French Morocco, including 3 cases reported in Casablanca and 2 cases in Rabat.

Sweden.—For the period June 1–15, 1945, 24 cases of typhus fever were reported in Sweden, including 6 cases reported in Malmo, Sweden.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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STUDIES ON THE PHARMACOLOGIC ACTION AND THE PATHOLOGY OF ALPHANAPHTHYLTHIOUREA (ANTU)

I. PHARMACOLOGY [1]

By WM. T. MCCLOSKY, *Pharmacologist*, and M. I. SMITH, *Chief Pharmacologist, United States Public Health Service*

The investigations by Richter and associates (*1*) of phenylthiocarbamide taste thresholds in rats and humans led them to study the toxic effects of this substance in rats with the interesting observation that it was capable of producing in relatively small doses large serous effusions in the thoracic cavity, and that repeated administration of the drug in progressively larger amounts induced a considerable degree of tolerance (*2*, *3*). Further unpublished investigations of this and related compounds led him to suggest that alphanaphthylthiourea, which for brevity will be referred to as ANTU, might be used advantageously as a rodenticide. The purpose of this report is to record some of our observations on the toxicology and the pharmacologic action of ANTU in several species of laboratory animals under conditions of acute, subacute, and chronic poisoning.

EXPERIMENTS IN RATS

The acute toxicity of ANTU in rats was determined by administering the substance in gum acacia suspension by stomach tube. Albino rats of the Wistar strain were used throughout. Animals of both sexes, weighing 125 to 200 gm., kept on a stock diet of Purina dog chow, were used. Groups of 10 were used in each experiment. The results of a total of 170 rats given graded doses of ANTU shown in table 1 indicate slightly over 18 percent mortality at a dose level of 20

TABLE 1.—*Acute toxicity of ANTU in rats, oral administration, stock diet*

Dose (mg. per kg.)	Number	Mortality, percent	Average	Dose (mg. per kg.)	Number	Mortality, percent	Average
20	10	0	18.3	50	10	80	70
	10	60			10	30	
	10	20			10	100	
	10	30		75	10	30	7[illegible]
	10	0			10	80	
	10	0			10	100	
35	10	30	61	100	10	100	100
	10	50			10	100	
	10	100					

[1] From the Division of Physiology, National Institute of Health.

mg. per kg., 60 to 70 percent mortality at the dose levels of 35 to 75 mg. per kg. and 100 percent mortality at 100 mg. per kg. Symptoms of labored respiration and muscular weakness developed in about 6 hours, and death occurred in from 7 to 36 hours. All animals that came to autopsy showed profuse, clear, straw-colored fluid in the pleural cavity, frequently a small amount of clear fluid in the pericardium, but no other effusions. Animals killed after a survival period of 72 hours or longer gave no evidence of effusions, and it is not known whether fluid was never formed or whether fluid had formed and was reabsorbed.

Examination of the pleural and pericardial effusions for protein content by the refractometric method of Sunderman (*4*) indicated an average of from 3.3 to 4.2 percent at the different dose levels, with no definite relationship between the protein content and drug dosage. No experiments were made to determine whether the protein is chiefly albumin, globulin, or a combination of both.

Attempts to induce chronic ANTU poisoning in rats by incorporating the substance at a level of 0.1 percent in a semisynthetic diet were unsuccessful. The animals refused the food, deteriorated rapidly, and died for the most part of inanition in from 5 to 30 days. No characteristic pathology was to be found in such animals, except in the few that died within 1 to 5 days, which usually showed the typical hydrothorax.

Tolerance was readily induced in rats on the stock diet by administering to the survivors progressively increasing doses of ANTU at 3- to 4-day intervals. In this manner the mortality from 50 mg. per kg., which in the nontolerant animals was 70 percent, was reduced to zero in one series, and 17 percent in another; and a dose of 100 mg. per kg., which in the nontolerant animals gave 100 percent mortality, gave no deaths in one series and 42 percent in another. Death following large doses in tolerant animals was often delayed, and effusions were strikingly absent even in animals dying within 24 hours, though the lungs were usually edematous and hemorrhagic. The livers in some of these animals showed varying degrees of fatty degeneration. The experimental data on induced tolerance in rats are summarized in table 2, and indicate that they may withstand five to six times the dose for normal nontolerant animals. The absence of effusions would seem to suggest an altered mode of action of the drug in the tolerant animal.

In an effort to shed some light on the mechanism of tolerance and the apparent variation in individual susceptibility as revealed in the data of table 1, experiments were made to determine whether dietary deficiency or liver injury induced by dietary means or hepatotoxic agents would have any effect on the acute toxicity of ANTU. Accordingly groups of rats were kept for periods varying from 18 to 175 days

TABLE 2.—*Tolerance to ANTU induced in rats on stock diet*

Dose (mg. per kg.)	Days between doses	Number of animals	Mortality (percent)	Dose (mg. per kg.)	Days between doses	Number of animals	Mortality (percent)
Series 1:				Series 2:			
10	0	20	5	20	0	20	30
20	3	19	0	50	4	14	0
35	3	19	0	75	3	14	0
50	4	[1] 23	17	100	3	14	0
100	3	19	42	200	3	14	70
200	4	10	80	300	3	5	80

[1] 19 survivors in this series plus 4 from another series similarly treated.

on the respective experimental diets and then were tested for susceptibility to a standard dose of ANTU. The diets consisted of casein, 5 percent, dried brewers' yeast to supply the vitamins of the B group, 4 percent salt mixture, 2 percent cod liver oil, 8 percent olive oil and starch. Variations in the protein and fat content were made by corresponding changes in the starch content.

Table 3 summarizes the results of this study. Ten milligrams per kilogram of ANTU was chosen as the standard dose since in normal animals on a stock diet it gave an average mortality of 5 percent

TABLE 3.—*Effect of dietary deficiencies and other factors on susceptibility to ANTU in rats*

Diet number	Description of diet	Days	Average weight change (gm.)	Number of animals	Dose (mg. per kg.)	Mortality (percent)
242	18 percent casein adequate control	28	+77	20	10	20
217	4 percent casein	28	+9	35	10	83
217A	4 percent casein + 2 percent cystine	34	+23	35	10	37
228	15 percent yeast + 30 percent lard + 0.5 percent cystine	18	−5	16	10	81
220	5 percent casein + 20 percent lard + 0.5 percent cystine + 1 percent choline	102	+63	12	10	100
211	18 percent casein + 1 percent carbon tetrachloride	175	+96	12	10	50
242A	18 percent casein, 6 daily doses of 1.5 mg. KI subcutaneously per rat	34	+63	14	10	57
230	18 percent casin + 0.5 percent p-aminobenzoic acid	25	+61	20	10	60

(table 2), and any deviation from this in the way of increased susceptibility could readily be ascertained with a considerable degree of accuracy. The data in table 3 indicate that a 10 mg. per kg. dose of ANTU given to animals on a semisynthetic adequate diet gave a mortality of 20 percent. Reduction of the protein to a 4-percent level increased susceptibility, while the addition of 2 percent cystine restored the mortality rate to approximately the same level as that prevailing in animals on the adequate diet. The low protein and high fat diet, No. 228, produced extremely fatty and enlarged livers and gave a high mortality incidence from the standard dose of ANTU,

and this was not corrected by the addition of 1 percent choline, the lipotropic action of which adequately compensated for the high fat content of the diet, since the liver in this group of animals showed no gross abnormalities. The high mortality incidence in the two groups, Nos. 220 and 228, must therefore be ascribed to the low protein rather than the high fat. It would seem that the 0.5 percent cystine supplement in diet No. 220 was insufficient to afford the degree of protection attained with 2 percent cystine in group 217A.

The mortality in group 211 which received 1 percent carbon tetrachloride was somewhat higher than that of the control group 242. The difference is not considered sufficiently great, however, to ascribe an important role to the type of liver injury induced as a factor in altering susceptibility to ANTU poisoning. The livers in this group of animals uniformly showed moderately severe to severe nodular cirrhosis.

Griesbach and associates (*5*) have recently reported a protective action from the subcutaneous injection of potassium iodide against the acute toxicity of thiourea in rats. Since the toxic manifestations of thiourea poisoning in rats resemble those of ANTU we repeated their experiment with potassium iodide as shown in experiment 242A of table 3 but have been unable to obtain results such as they reported for thiourea. The pretreatment with potassium iodide appeared to have increased rather than decreased the susceptibility to ANTU.

Graying of hair in rats ingesting phenylthiocarbamide as reported by Richter (*2*) suggested the possibility of an antagonistic action of p-aminobenzoic acid against ANTU. Accordingly, this substance was fed to rats for a period of 25 days at a concentration level of 0.5 percent in an otherwise adequate diet and at the expiration of the experimental period 10 mg. per kg. ANTU was given. It would appear that the ingestion of p-aminobenzoic acid has failed to afford protection, but, on the contrary, has seemed to increase susceptibility to ANTU.

EXPERIMENTS IN DOGS

A series of 7 dogs was treated with doses of ANTU varying from 25 to 200 mg. per kg., with a view to ascertaining the degree of susceptibility and the mode of action in this species. The results of this experiment are shown in table 4 and indicate that ANTU produces pleural and, to a lesser extent, pericardial effusions in the dog as in the rat, and that the susceptibility of the dog to ANTU is of about the same order of magnitude as that of the albino rat. All but one of the animals died within 18 to 23 hours. One animal, No. 3, survived 50 mg. per kg., but when given the same dose 6 weeks later died within 29 hours and showed, like all the others, copious fluid in the pleural cavity. The effusion protein estimated from specific gravity by the falling-drop method varied from 4.2 to 5.9 percent. The plasma protein of these animals determined by the same method before the ad-

ministration of ANTU gave values varying from 5.9 to 8.4 percent, with an average of 6.9 percent. It is evident that the effusion protein content in the dog is high, more than half that of the plasma protein, and in some cases appears to be as high as 85 percent.

TABLE 4.—*Acute toxicity of ANTU in dogs.—Oral administration*

Dog number	Weight (kg.)	Dose (mg. per kg.)	Hours survived	Pleural effusion protein
2	5.0	200	18	4.56
6	9.0	100	18	4.60
7	4.6	100	18	4.15
5	6.0	50	22	5.44
4	4.6	50	21	5.95
3	5.3	50	Survived [1]	----------
1	10.0	25	23	5.62

[1] At end of 42 days animal was given 50 mg. per kg. and succumbed in 29 hours. The pleural effusion had 5.6 percent protein.

EXPERIMENTS IN RABBITS

The results of the rabbit experiments with ANTU are shown in tables 5 and 6. The oral acute toxicity of ANTU in the rabbit appears to be low. Half a gram per kilogram was tolerated, and 1.0 gm. per kg. usually proved fatal but death was delayed for several days. Pleural effusions under these conditions were infrequent. With a

TABLE 5.—*Acute toxicity of ANTU in rabbits*

Rabbit number	Weight (kg.)		Dose (gm. per kg.)	Plasma protein (percent)		Pleural effusion protein (percent)	Remarks
	Initial	Final		Normal	At death		
1A	2.0	2.1	0.5	----------	6.3	None	Survived, killed 15 days.
2A	2.1	1.8	.5	----------	6.1	None	Do.
1	2.1	1.9	1.0	----------	6.2	None	Do.
2	2.0	----------	1.0	----------	5.4	4.7	Died in 3 days.
3	2.8	2.2	1.0	----------	7.6	None	Sick, killed in 4 days.
4	2.6	2.2	1.0	----------	5.3	1.6	Do.
5	1.9	1.3	1.0	----------	7.8	----------	Died in 10 days.
6	2.4	2.2	1.0	----------	----------	----------	Died in 6 days.
6A	2.6	----------	2.0	6.9	----------	6.6	Died in 18 hours.
7	2.7	----------	2.0	5.8	----------	6.7	Do.
8	2.4	----------	2.0	5.6	7.3	4.4	Sick, killed in 2 days.
9	2.1	1.5	2.0	6.7	5.2	None	Sick, killed in 7 days.
10	2.6	----------	2.0	7.0	----------	6.6	Died in 18 hours.

TABLE 6.—*Chronic toxicity of ANTU in rabbits, 200 mg. per kg. per day*

Rabbit number	Weight (kg.)		Number of doses	Died or survived	Plasma protein (percent)			Pleural effusion protein (percent)
	Initial	Final			Normal	Second day	Sixth day	
1	2.9	2.4	[1] 3½	Died	7.0	7.9	----------	None.
2	1.8	1.6	5½	do	6.8	7.9	4.6	Do.
3	1.9	1.9	2½	do	6.7	----------	----------	3.4.
4	2.5	2.2	4½	do	6.5	7.9	----------	None.
5	3.3	2.3	6½	Survived	7.4	8.6	8.9	Do.

[1] First dose 100 mg. per kg., subsequent doses 200 mg. per kg.

dose of 2.0 gm. per kg., the animals usually died within 18 to 48 hours with characteristic pleural effusions, with a protein content of from 4.4 to over 6.6 percent. Plasma protein determinations at death gave values which appear to fall within the normal range.

The chronic toxicity experiments in rabbits detailed in table 6 indicate that under these conditions pleural effusion occurs infrequently, and that there is no definite or characteristic change in the plasma protein in the course of intoxication. That the effects of the compound are cumulative is indicated by the fact that the animals generally succumbed from the additive effects of the several doses, each of which was no more than about 20 percent of the MLD.

EXPERIMENTS IN CATS

Four series of experiments were made in cats with a view to determining the effects of continued exposure to doses varying from 10 to 50 mg. per kg. per day. Our observations on the acute toxicity of ANTU in cats are limited, but in three experiments a single dose of 100 mg. per kg. killed two of the three animals used. Both animals had copious pleural effusion and a small amount in the pericardium.

The data in table 7 indicate that 20 to 50 mg. per kg. of ANTU given daily incorporated in the ration of lean ground meat usually killed cats in from 2 to 23 doses. Pleural effusion was present in 2 of the 5 animals on 50 mg. per kg. and 3 of the 5 animals on 20 mg. per kg. The effusions had a protein content of from 2.4 to 4.3 per-

TABLE 7.—*Chronic toxicity of ANTU in cats at three different dose levels, oral administration*

Cat number	Weight (kg.)		Number of doses given	Died or survived	Remarks
	Initial	Final			
50 mg. per kg.:					
1	2.2	2.0	8	Died	
2	2.2	1.1	22	do	Terminal plasma bilirubin 2.9 mg. percent.
5	2.0		4	do	Pleural effusion protein 2.4 percent.
6	2.1		2	do	Pleural effusion protein 3.0 percent.
7	2.1	1.2	23	Survived	
20 mg. per kg:.					
3	2.3		2	Died	Pleural effusion protein 3.7 percent.
4	2.7		23	Survived	
8	2.5	2.0	23	Died	Terminal plasma bilirubin 25 mg. percent.
9	2.5	2.5	11	do	Pleural effusion protein 4.3 percent.
10	2.6	2.6	12	do	Pleural effusion protein 3.3 percent.
10 mg. per kg.:					
3	2.3	2.2	20	Died	Initial plasma protein 5.7 percent; terminal 6.9 percent.
4	3.2	2.8	30	Survived	Initial plasma protein 5.5 percent; terminal 4.4 percent.
5	2.3	2.4	30	do	Initial plasma protein 5.2 percent; terminal 4.4 percent.
7	2.1	2.2	30	do	Initial plasma protein 5.8 percent; terminal 4.5 percent.
8	2.4	2.2	27	do	Initial plasma protein 6.4 percent; terminal 6.2 percent.

cent. A dose of 10 mg. per kg. similarly given daily over a period of 36 days was usually survived. Plasma protein determinations in the series of five cats on 10 mg. per kg. per day at the beginning and at the end of the experiment indicate a reduction in the protein content with the progression of intoxication in three animals and no change in two. The determinations were made by the refractometric method (*4*) and the values are probably too low.

Hematologic studies in the course of this experiment which were essentially negative in other respects revealed the appearance of bilirubinemia in some of the animals. Accordingly, another experiment was set up with a view to studying this in greater detail. A series of seven animals had their plasma protein and plasma bilirubin determined before the drug was given and then again at weekly intervals during the course of chronic intoxication, which consisted of 20 mg. per kg. per day. Changes in the plasma protein values in the interim did not appear significant and only the initial and final values are given in table 8 which summarizes the results of this experiment.

TABLE 8.—*Chronic toxicity of ANTU in cats, oral administration, 20 mg. per kg. per dose until death*

Cat number	Weight (kg.)		Number of doses given	Days survived	Plasma protein (percent)		Bilirubin, mg. percent at—			
	Initial	Final			Initial	Final	0 days	14 days	21 days	25 days
11	3.1	2.6	10	20	7.1	8.0	0	2.9	-------	-------
12	2.6	2.2	12	25	6.5	5.9	0	trace	trace	8.9
13	1.8	1.8	19	24	7.1	5.9	0	0	1.3	-------
14	3.4	3.0	15	21	6.9	7.2	0	0	2.3	-------
15	2.5	2.0	4	22	7.2	6.5	0	0	4.0	-------
16	2.9	2.4	11	23	6.7	7.0	0	3.5	20.8	-------
17	2.3	2.[illegible]	22	28	5.8	5.4	0	0	2.6	7.3

The plasma bilirubin values determined by a method previously described (*6*) are shown in greater detail and indicate a consistent bilirubinemia, with an onset at from 14 to 21 days after the start of the experiment. The bilirubinemia is rapidly progressive in nature. Though its exact cause has not been established it appears to be hepatogenous in origin because of the direct van den Bergh reaction which could be elicited in every instance, and because of lack of consistent evidence of excessive blood destruction and anemia, except possibly in two animals in which the hemoglobin fell from 12.3 to 6.8 and from 14.0 to 9.3 gm. On the basis of this and the histopathological evidence described below it would appear most likely that the bilirubinemia may be the result of leakage of bile from the bile canaliculi into the venous sinusoids. Increased capillary permeability in this

situation appears to be the cause of the bilirubinemia, as the altered permeability in the pulmonary vascular bed would seem to be the cause of the pleural effusions.

It should be noted in this connection that Gargill and Lesses (7), who have recently reported on toxic reactions to thiouracil, describe jaundice in some of their cases which they believe was due to obstruction of the intrahepatic biliary tract. The icterus in their cases persisted for as long as 100 days.

SUMMARY

The acute and chronic toxicity of alphanaphthylthiourea (ANTU) was studied in albino rats, rabbits, cats, and dogs, with the following results:

1. The acute toxicity of ANTU varies in different animal species, rats and dogs being the most susceptible and rabbits the least.
2. Pleural, and to a lesser extent pericardial, effusions are characteristically present in all species if death is not delayed much beyond 24 hours.
3. The effusions have a protein content usually over one-half that of the plasma.
4. Tolerance to the acute toxicity of ANTU can be induced in rats by administering progressively increasing doses at 3- to 4-day intervals. No effusions have been found in tolerant rats dying from large doses.
5. Chronic toxicity experiments in rabbits and cats indicate a cumulative action.
6. In chronically poisoned cats effusions are absent, but instead bilirubinemia is regularly produced, and this seems to be the result of altered capillary permeability with leakage of bile from the bile channels into the venous sinusoids.

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II. PATHOLOGY [2]

By R. D. Lillie, *Medical Director, United States Public Health Service*

The material studied comprised 4 rabbits, dead on the seventh to twentieth day; 8 rats, dead at 14 to 34 days; and 17 cats, dying or killed at 13 to 38 days.

Because of an icterus of fairly marked grade observed in some of the cats, attention centered at first on the liver, and in the present series of

[2] From the Pathology Laboratory, National Institute of Health.

rats only that organ was saved for study. In this species there was a moderate to severe fatty degeneration in all 8 animals, perhaps more pronounced in the midzones of the lobules and least in the center. Fat droplets were usually fine and dispersed throughout liver-cell cytoplasm. Sometimes segregation in the borders of the cytoplasm was noted, and medium and coarse fat globules appeared infrequently. Hemosiderosis of scattered littoral cells was noted in one rat, while in five the ferrocyanide test revealed no iron. Only in one of the eight rats were there noted a few patches of cytoplasmic oxyphilia and slight karyorrhexis of centrolobular liver cells, perhaps with a few polymorphonuclear leucocytes.

In rabbits also there was constantly an irregular midzonal to diffuse fatty degeneration of liver cells. Fat droplets were generally small and dispersed throughout the cytoplasm, sometimes restricted to the cell-border zone. In one of the four animals there were vague areas of cytoplasmic oxyphilia and slight karyorrhexis of liver cells but no definite necrosis. In the rest bulky areas of coagulation necrosis were present, usually midzonal, sometimes diffuse. Periportal islets of surviving liver cells were more frequent than centrolobular. In some areas of necrosis capillary thrombosis was noted; in some, polymorphonuclear leucocyte infiltration; and in others, proliferation of stroma cells, depletion of liver cells, and formation of wide blood spaces. In one rabbit a partial interportal trabeculation by strands of delicate collagen fibrils was noted, while in three the bulky portal scars and lymphocyte infiltrations often seen in rabbits were absent.

As in rats and rabbits the liver of the cat almost regularly presented a moderate to severe fatty degeneration. In individual liver cells fat droplets were usually fine or medium in size and dispersed throughout the cytoplasm. Involvement was usually greatest in the midzones of the lobules, sometimes least, sometimes most in the centers of the lobules.

In 10 of the 17 cats there was moderate to pronounced centrolobular congestion, accompanied in 4 by atrophy of cell cords and in 2 of these by centrolobular cytoplasmic oxyphilia grading into coagulation necrosis.

Icterus was grossly evident in nine cats. These cats gave maximum serum bilirubin levels at or before death varying from 1.3 to 20.8 mg. per 100 cc. Several showed green discoloration of the urine in the bladder. In two or three, green zones were seen across the base of the renal pyramids on section. In five of these cats the bile capillaries throughout the liver lobule were distended by threads of apparently inspissated bile. Larger bile ducts in these cats sometimes contained hyaline oxyphilic masses, mucus, or mucopurulent exudate. However, the gall bladders were regularly distended with dark-green,

thick, viscid bile, and the intestinal contents were always bile-stained. Small bile ducts were often normal.

However, in the 20 mg. per kg. series, seven of eight cats surviving 19 days or more presented in the periportal areas and often along the interportal lines more or less numerous solid cords and narrow tubules of small basophilic epithelial cells. Mitoses were sometimes seen in these cells.

Often more or less swelling of phagocytic littoral cells was noted, and in 11 of the 17 cats these cells contained considerable amounts of demonstrable ferric iron, either as diffuse cytoplasmic staining or as granular light-brown pigment. In a few cats, brown iron-free pigment was present as well as typical hemosiderin.

The gall bladder was normal, though partly autolyzed in six cats, while in the seventh there was much irregular infiltration of the mucosa by lymphocytes and fewer macrophages with ingested nuclear fragments.

The pancreas in one rabbit contained areas of necrosis of lobules, grading from purulent infiltration and coagulated necrotic acini peripherally to caseation centrally. In another rabbit the pancreas was normal. Usually the pancreas was normal in cats but in cat 16, in which the most pronounced small bile duct proliferation was seen, there were also many proliferating small tubules of basophilic cells about the large pancreatic duct adjacent to the duodenum.

In rabbits, splenic follicles were variously composed chiefly of small lymphocytes or a mixture of small and large lymphoid cells. Only in the animal killed at 7 days were there slight intrafollicular phagocytosis of nuclear debris, dilated and congested pulp sinuses, and an absence of demonstrable hemosiderin. All showed more or less swelling of sinus and pulp littoral cells, with or without numbers of macrophages in the sinuses. Erythrophagia was only infrequently demonstrable, but the three animals surviving 13 to 20 days presented more or less diffuse and granular iron-positive pigmentation of littoral cells and macrophages in the pulp. Lymphoid elements in the pulp were inconspicuous.

In cats, splenic pulp generally contained a moderate amount of blood and few to moderately numerous lymphocytes. Normoblasts were infrequently identifiable and megakaryocytes were rare. Slight to moderate hemosiderosis was present in 7 of 16 spleens, erythrophagia in 1. Hemosiderosis was noted in both livers and spleen in 6 cats, and in one or the other in 13 of the 17.

No consistent significant alterations were observed in 20 lymph nodes from 10 cats: 6 cervical, 7 thoracic, 7 abdominal. A cervical lymph node from 1 rabbit was likewise negative.

Thymus was normal in one cat.

Bone marrow of the sternum was studied in a single cat. It was

quite cellular, with a predominance of young forms, and active erythropoiesis as well as myelopoiesis.

Submaxillary gland from one rabbit was normal.

Esophagus was normal in the 4 rabbits and in 12 levels from 7 cats. In 1 cat the mucosa presented focal perivascular lymphocyte infiltration.

The trachea showed focal lymphocyte infiltration of the mucosa in most of the rabbits and cats. In one cat sections of adults and eggs of *Eucoleus serophilus* were identified in the mucosa.

In the thyroid in rabbits colloid was generally poorly stained, lightly oxyphil, perhaps granular or vacuolated in appearance. In two of the four animals moderate numbers of acini contained no stainable colloid, and others contained some moderately dense normal appearing colloid. In one of these, hyaline deeply basophil masses were present in a few acini. Acinar epithelium was generally cuboidal, sometimes low columnar. Interstitial congestion was sometimes present.

In three cats thyroid colloid was moderately oxyphilic and acini were of small to medium size. In the remaining five, colloid was very poorly stained in some areas, moderately oxyphil in others, sometimes granular, reticulated or vacuolated in appearance, and sometimes absent. Acini were more variable in size and in one cat there were lymphoid follicles and interstitial lymphocyte infiltration.

Single parathyroids were normal in each of 3 rabbits, and 11 normal parathyroids were found in 6 cats.

Small intestine was normal in three cats, in one a catarrhal enteritis was present, in two there were scattered pus-filled glands, and in one an area of hemorrhagic necrosis and ulceration with subjacent granulation was present. Stomach was normal in one cat, colon presented a catarrhal reaction in another, and buccal mucosa showed focal lymphocyte infiltration in a third. Areas of omental necrosis or suppuration were noted in two of seven cats.

In one rabbit killed after 7 days there was extensive serous exudate alternating with and grading into hemorrhage in the pulmonary alveoli. In another there were no histologic lesions of the lung, and no material was saved from the other two.

In the lungs of the cats receiving 10 mg. per kg. dosage only slight and apparently nonspecific changes were noted. Catarrhal bronchitis in moderate grade was seen in 5 of 10 cats on 20 mg. per kg. dosage, in 6 there was slight to marked serous to serosanguinous exudation in alveoli, with some macrophages and epithelial cells in the exudate in some. In 4 of these cats proliferative changes were noted. In 1 these were localized in 1 of 4 sections and consisted of peribronchial epithelialization of alveoli accompanying a purulent bronchitis. In 3 others there was thickened deeply basophil atriobronchiolar epithelium, sometimes with slight stratification and

irregular arrangement of nuclei. These proliferative changes were found only in the presence of serous, serosanguinous, and serocellular exudates.

In several cats treated for 25 to 38 days there was more or less copious mucoid material in the media of the aorta or pulmonary artery near the base of the heart. Other animals treated 25 days or less did not show this picture.

In 10 of 15 cats few to numerous heart muscle fibers contained few to numerous fine fat droplets. Cross striation was usually plainly evident. Focal lesions were few and inconstant, but included a few necrotic muscle fibers in 2 cats, focal hemorrhage in 2, focal scarring or fibroblast reaction in 4, focal polymorphonuclear infiltration in 2. In 8 cats there were no focal lesions.

Skeletal muscle was normal in six cats; contained few and numerous sarcosporidia respectively in two more, and in one there were some hyaline oxyphilic muscle fibers and some interstitial and fascial mucoid exudate. In one rabbit, also, skeletal muscle was normal.

In one rabbit the adrenal was normal, and its cortex moderately heavily laden with fatty substances. In cats lipid content of the cortex seemed diminished, and fine fat droplets were most often concentrated in the outer half of the fascicular zone. The medulla was normally composed largely of chromaffin cells in five cats. In the two remaining cats the chromaffin tissue was partly replaced by solid areas of larger, more basophilic, chromaffin-free cells. Abutting directly on the large-cell areas were strands or solid areas of smaller cells containing much chromaffin.

In all four rabbits, fatty changes were observed in the renal epithelium. Usually moderately severe accumulation of fine fat droplets was seen in loop tubules in the corticomedullary border. Both droplet size and frequency were more variable in the epithelium of the convoluted tubules, varying from few fine droplets to numerous fine and medium fat globules. In one rabbit glomerular epithelium participated in the fatty alteration. Desquamation of fatty cells was noted in another rabbit, and interstitial fat phagocytes were also seen in this animal. In addition this rabbit presented calcification of scattered cortical tubules, hyaline glomerular thrombi, and many hyaline casts. Pelvic and cortical lymphocyte infiltration was seen in one rabbit, cortical infiltration alone in another.

In 4 of 15 cats there were found more or less numerous bile casts, chiefly in the large collecting tubules in the basal half of the renal pyramid, fewer in cortical convoluted tubules. Otherwise the kidney presented the usual normal heavy fatty infiltration of the epithelium of convoluted and often loop tubules, and scattered foci of lymphocyte infiltration in cortex and in pelvic mucosa which are probably assignable to intercurrent natural infections.

SUMMARY

Alphanaphthylthiourea produces a fatty degeneration of the liver of fine-droplet type in rats, rabbits, and cats. Necrosis was inconspicuous in rats and cats, and prominent in rabbits. In cats there is often further an intrahepatic obstructive icterus with bile casts in the kidneys as well as in the hepatic bile capillaries and in some animals there appears a prominent proliferation of small bile ducts.

Often there is a moderate splenic and hepatic hemosiderosis in cats, and splenic hemosiderosis in rabbits. A moderate thyroid hyperactivity is noted, more pronounced in rabbits than in cats.

Pulmonary edema and hemorrhage were noted in rabbits and cats in addition to the grossly observed hydrothorax in all three species. In the cats there was sometimes a conspicuous atriobronchiolar epithelial hyperplasia.

There were conspicuous fatty changes in the renal epithelium in rabbits, but it is not possible to state whether the normal fatty condition of the renal cortex in cats was exaggerated.

In the adrenal medulla of the cat, hyperplastic changes were noted.

A NOTE ON PHYSICIAN TIME PER PATIENT IN PRIVATE PRACTICE

By BURNET M. DAVIS, *Surgeon (R), United States Public Health Service*[1]

INTRODUCTION

A basic problem in estimating the number of physicians required to satisfy the demands of a population for medical care is the determination of the amount of physician time required per office visit. Because of the individualistic nature of medical practice, such determinations are difficult to make, particularly in respect to physicians engaged in private office practice.

Some years ago Lee and Jones (*1*) postulated, on the basis of a number of expert opinions, the amount of physician time required for proper diagnosis and treatment of specific categories of disease. It is of some interest that these authors used 15 minutes per general practitioner office visit as a reasonable time for handling routine types of cases.

On the other hand, Ciocco and Altman (*2*) have presented data from which the average length of time per office visit of private general practitioners in Maryland in 1942 may be estimated at 20.6 minutes.[2] This estimate includes an unknown amount of time spent in the office

[1] From the Division of Public Health Methods. Grateful acknowlegement is made to Assistant Statistician Marion E. Altenderfer for her assistance in handling the statistical material presented.

[2] Computed from data in tables 4 and 9, *op. cit.*, on the assumption of a 5½-day week.

while not actually seeing patients, but, unlike that of Lee and Jones, represents actually prevailing practice in the area studied.

The present report describes the findings of a study of the time spent and the number of patients seen by six individual physicians engaged in private practice in a war industrial area in 1944.

METHOD OF STUDY

During December 1943 six physicians in a war-swollen community were induced by a local housing authority to hold office hours on a rotating schedule in two war-housing projects. An understanding was worked out between the housing authority, representatives of the local medical society, and the individual physicians concerned. The housing authority agreed to make office space available (one office in each of two projects) and in cooperation with local voluntary agencies, to provide nursing and clerical assistance.

The physicians agreed that at specified times on each week day, namely, 10:30 a. m., 4:30 p. m., and 7:30 p. m., a physician would be present at one office or the other, or both. A weekly schedule, stating the name of the physician to be present at each period, was worked out and posted in the projects. The number of periods per week scheduled for each physician varied considerably, depending on the amount of time each felt able to give to practice in the war-housing projects (table 1, column 2). On the average, approximately 27 out of the possible 36 periods per week were scheduled by the 6 physicians in the 13 weeks studied.

It was agreed that the physician would not be expected to remain for any specified length of time, but could leave as soon as all patients present had been seen. To be sure of seeing the physician, therefore, patients had to arrive at or soon after the scheduled time. This procedure resulted in much waiting time by the patients but reduced waste time on the physician's part to a minimum.

All of the physicians had been previously practicing in the area and each of them continued to maintain his private office in the prewar areas of the community. All physician-patient relationships, both professional and financial, were on a strictly private practice basis, the physician making his own arrangements with regard to collection of fees. It is to be emphasized that this was not a group practice scheme; the individual physicians collaborated in working out the weekly schedule, but only one physician was present in the office at any one period, and each carried on a general practice.

Records were kept by the nursing and clerical staff of the time of arrival and departure of each physician and the number of patients seen at each period. Despite other heavy demands on the physicians' time, the experience during the 3 months studied revealed that the

physicians lived up to the posted schedule with commendable conscientiousness and only in rare instances were patients left without a physician at a scheduled period.

FINDINGS

During the months of January, February, and March 1944, 357 periods were scheduled and in all but 7 instances the physician was present. Data for analysis were available for 318 of these periods, since for 17 the time of arrival or of departure was not recorded and at 15 additional periods no patients presented themselves.

Variation among physicians.—The 318 periods were distributed among the 6 physicians as shown in table 1. The physicians are listed in order of decreasing number of periods attended; it will be noted that

TABLE 1.—*Patient load and physician time per patient, by individual physician*

(1)	(2)	(3)	(4)	(5)	(6)
Physician	Number of periods	Number of patients	Average number of patients per period	Average minutes per patient	
				All periods	Excluding single-patient periods [1]
All physicians	318	1,602	5.0	17.3	16.9
A	91	395	4.3	12.7	12.2
B	74	505	6.8	19.2	19.2
C	63	317	5.0	17.3	17.0
D	39	149	3.8	20.2	18.8
E	36	163	4.5	17.7	17.6
F	15	73	4.9	21.6	21.3

[1] The number of periods at which only 1 patient was seen totaled 27, as follows: Drs. A, 13; B, 3; C, 3; D, 5; E, 1; F, 2.

there is considerable variation in the average number of patients seen per period by the several physicians. It is reasonable to consider column (2) as indicating the amount of service the physician was willing to offer, and column (4) as a rough index of the physician's popularity.

Column (5) shows the average time per patient for each of the physicians. Since it was generally understood that the physician would leave as soon as the patients waiting in the office had been seen, it seems unlikely that these figures include an appreciable amount of time spent by the physician in waiting. A possible exception exists in the 27 periods at which only a single patient was seen, since the physician might wait a few minutes if no patients were present at the time of his arrival. However, he was very unlikely to wait further after seeing one or more patients.

Column (6) shows the average time per patient for the 291 periods at which 2 or more patients were seen; it is believed that these figures more truly represent the amount of time actually spent seeing patients.

It is evident that there is considerable variation in the average amount of time devoted to each patient by the several physicians. Reference to column (4), shows that the speed of seeing patients is not directly related to the average number of patients seen by the respective physicians. For example, Dr. A saw on the average only two-thirds as many patients per period as did Dr. B, yet Dr. B spent more than half again as much time per patient as did Dr. A. The differences found in average time per patient appear to be the result of individual differences in habits of practice.

Time per patient in different periods.—Taking the data for all 6 physicians together, examination of the average time per patient for each of the 318 periods (and for the 291 periods remaining when single-patient periods are excluded) shows the distribution presented in table 2.

TABLE 2.—*Distribution of periods by physician time per patient*

Average minutes per patient	Number of periods		
	Total	Single patient	Excluding single-patient periods
Total	318	27	291
Less than 10.0	25	0	25
10.0–14.9	73	2	71
15.0–19.9	91	2	89
20.0–24.9	61	1	60
25.0–29.9	22	2	20
30.0–34.9	23	10	13
35.0 and over	23	10	13

The extent of the range (the extremes were 5.0 and 100 minutes, or 5.0 and 45 minutes excluding single-patient periods) is of some interest. As would be expected from the average of 16.9 minutes (table 1) the largest number of periods shows a per-patient time of between 15 and 20 minutes. In more than half of the periods (52 percent of total; 55 percent excluding single-patient periods) the average time spent per patient ranged between 10 and 20 minutes. It will be noted that the number of single-patient periods is greatest for the two longest time intervals.

Under the prevailing arrangement without an appointment system, the number of patients seen per period varied widely, from no patients (15 periods) to a maximum of 16 patients (2 periods). Table 3 shows this distribution: the most frequent number of patients seen was 5, but 3- and 6-patient periods occurred nearly as often.

Table 3 also shows the average physician time per patient for each group of periods at which the specified numbers of patients were seen. It is evident that there is a steady decrease in the time per patient as the number of patients per period increases. The findings suggest

TABLE 3.—*(a) Distribution of periods by number of patients seen; and (b) variation in average physician time per patient with number of patients per period*

Number of patients seen in period	Number of periods	Average physician time per patient (minutes)	Number of patients seen in period	Number of periods	Average physician time per patient (minutes)
All periods	318	17.3	5	49	16.4
			6	45	16.2
1	27	36.5	7	21	16.3
2	35	25.1	8	17	15.8
3	47	20.7	9	20	14.4
4	36	17.6	10 or more	21	15.0

that a minimum time of around 15 minutes per patient tends to be reached. As suggested above in connection with table 1, the time recorded for single-patient periods possibly includes some waiting time, so that the figure of 36.5 minutes shown for this group may be somewhat high. But even if this group of periods is excluded, as has been done in figure 1, the phenomenon is striking.

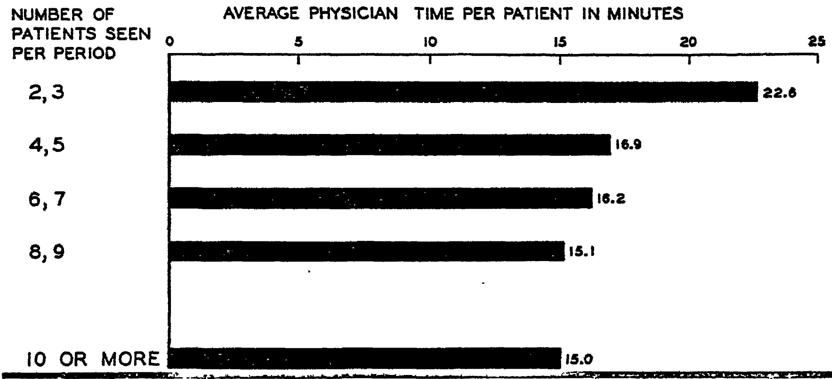

FIGURE 1.—Variation of physician time per patient with number of patients seen per period.

To permit use of averages based on larger numbers of periods, the groups have been combined in pairs in figure 1, in addition to excluding the 1-patient periods. Thus, the 5 bars are based on averages of 82, 85, 66, 37, and 21 periods at which 209, 389, 417, 316, and 244 patients, respectively, were seen.

DISCUSSION

It is recognized that the conditions under which this study was done are not, in all respects, typical of private medical practice. However, there would seem to be no reason why the conditions prevailing so far as the professional work is concerned should be significantly different from that in ordinary private practice by busy physicians in wartime. The physicians had the full-time services of a nurse and the usual amount of basic office equipment with which to work. It is believed that the type of practice involved was generally similar to that carried on by general practitioners in medium-sized cities.

The over-all average of approximately 17 minutes per patient is quite close to Ciocco and Altman's findings in Maryland (20.6 minutes), when allowance is made for some waiting time in the latter figure, and for the probability that the physicians in this war-swollen community were under greater pressure than the average Maryland physician in 1942.

It is of interest to note the extent of variation among the physicians in average time per patient. While too few physicians were involved to warrant analysis of the differences observed, it may be seen that even in this small group four physicians spent on the average more than half again as much time per patient as did the physician whose average time was lowest.

The relationship shown in figure 1 between the time spent per patient and the number of patients merits further discussion. In general, nearly all of the patients arrived at approximately the time for which the period was scheduled and awaited their turns. It seems probable, therefore, that the physician was generally aware of the number of patients waiting to see him and tended to adjust the speed of his work accordingly. It is difficult to see how the observed phenomenon can be explained otherwise since the variation is too consistent and based on too large a number of observations to be the result of chance. If this is the correct interpretation, this would seem to be rather strong evidence in favor of an organized appointment system to distribute the patient load as evenly as possible.

If physicians require more than 20 minutes per patient to diagnose and treat those who happen to present themselves 2 or 3 at a time, can patients who arrive 8 or 10 at a time expect adequate study and treatment in 15 minutes each? Under any organized method of provision of medical care, no less than in private practice, it would seem essential to safeguard the physician from undue pressure to dispose of patients more rapidly than is consistent with a high quality of professional work.

SUMMARY

Data are presented on time spent by 6 private general practitioners in holding 318 office periods comprising 1,602 patient visits in the first 3 months of 1944. The main findings were:

1. The average time spent per patient was 16.9 minutes but varied among the six physicians from 12.2 to 21.3 minutes.

2. The average time per patient decreased steadily as the number of patients per office period increased.

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DEATHS DURING WEEK ENDED AUGUST 25, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Aug. 25, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,557	7,472
Average for 3 prior years	7,602	
Total deaths, first 34 weeks of year	308,436	312,399
Deaths, under 1 year of age	617	601
Average for 3 prior years	623	
Deaths under 1 year of age, first 34 weeks of year	20,573	21,073
Data from industrial insurance companies:		
Policies in force	67,376,258	66,705,582
Number of death claims	12,865	12,097
Death claims per 1,000 policies in force, annual rate	10.0	9.5
Death claims per 1,000 policies, first 34 weeks of year, annual rate	10.4	10.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 1, 1945

Summary

The current week is the first week since July 7 during which the total reported cases of poliomyelitis declined—917 cases were reported currently, as compared with 931 for the preceding week and 1,682 for the corresponding week in 1944, which was the peak for that year. If recorded by date of onset instead of by date of reports received by the local health officers, the peak of incidence would probably be a week or 10 days earlier. Currently, the largest numerical decreases occurred in New York (from 191 to 138), Illinois (from 121 to 94), and Texas (from 73 to 33), while the largest increases were reported in Missouri (8 to 29), Utah (14 to 34), (Iowa 19 to 31), New Jersey (88 to 96), Kansas (3 to 15), and Virginia (20 to 32). A total of 6,156 cases has been reported to date, as compared with 9,474 in 1944 and 5,886 in 1943 for the same period.

In addition to poliomyelitis, the incidence to date of diphtheria, meningococcus meningitis, scarlet fever, and endemic typhus fever is above the normal expectancy, and there is some indication of an increase in the death rate for diphtheria during the first half of 1945. Incidence below the median expectancy has been recorded to date for influenza, measles, smallpox, typhoid fever, and whooping cough—measles less than one-fifth the incidence in 1943 and 1944, and both smallpox and typhoid fever below the respective figures for any prior year. A total of 22 cases of anthrax has been reported to date, as compared with 31 cases for the corresponding period in 1944.

Although reports from 93 large cities in the United States for the past two weeks show a higher urban mortality than for the same weeks last year, the total to date is below that for last year. Currently 8,548 deaths were recorded in these cities, as compared with 8,557 for the preceding week, 7,610 for the same week in 1944, and a three-year average of 7,747. To date this year a total of 316,984 deaths has been reported, as compared with 320,009 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended September 1, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944	
NEW ENGLAND												
Maine	0	0	0	------	------	------	1	9	11	0	0	0
New Hampshire	0	0	0	------	------	------	0	0	0	0	1	0
Vermont	0	0	0	------	------	------	14	2	2	0	0	0
Massachusetts	3	4	1	------	------	------	46	26	38	0	4	2
Rhode Island	0	2	0	------	------	------	0	1	3	0	1	0
Connecticut	0	1	0	------	2	1	11	11	11	3	5	0
MIDDLE ATLANTIC												
New York	13	6	6	[1] 2	[1] 1	[1] 2	24	50	57	2	19	8
New Jersey	2	0	2	------	1	2	12	12	20	3	8	1
Pennsylvania	10	8	4	3	------	------	27	21	30	12	11	3
EAST NORTH CENTRAL												
Ohio	4	2	3	------	5	5	7	8	24	2	8	1
Indiana	4	8	8	3	------	4	2	2	1	1	0	1
Illinois	1	4	5	1	1	2	128	7	10	3	6	3
Michigan [2]	7	5	6	------	1	1	24	4	16	5	9	2
Wisconsin	3	2	1	13	2	11	17	113	79	1	2	1
WEST NORTH CENTRAL												
Minnesota	7	0	2	------	------	------	2	3	3	1	1	1
Iowa	3	2	2	------	------	------	0	3	4	0	0	0
Missouri	2	1	1	2	------	------	3	4	4	0	5	3
North Dakota	0	3	1	8	5	5	1	3	3	0	3	0
South Dakota	3	2	2	------	------	------	2	0	3	0	0	0
Nebraska	0	2	1	1	------	------	1	1	2	0	1	0
Kansas	8	5	3	------	------	------	13	4	8	1	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	3	0	0	0	1	0
Maryland [2]	6	5	1	------	------	2	3	9	9	0	0	1
District of Columbia	0	0	0	------	------	------	0	1	3	0	0	0
Virginia	5	6	5	83	24	30	4	5	5	0	1	1
West Virginia	8	2	2	------	1	1	0	2	2	1	1	2
North Carolina	34	3	27	------	5	------	4	12	10	1	5	2
South Carolina	10	11	10	143	64	64	4	5	5	2	0	1
Georgia	9	12	12	2	52	19	1	13	7	0	0	0
Florida	6	7	3	2	1	3	1	72	4	2	2	0
EAST SOUTH CENTRAL												
Kentucky	7	9	7	------	1	2	4	2	8	1	5	1
Tennessee	8	5	5	5	6	4	5	1	3	2	1	1
Alabama	18	6	9	1	12	12	0	3	16	1	2	2
Mississippi [2]	13	10	11	------	------	------	------	------	------	0	1	0
WEST SOUTH CENTRAL												
Arkansas	11	4	6	47	10	2	7	6	6	2	1	0
Louisiana	4	4	2	5	------	1	1	0	0	0	1	1
Oklahoma	5	5	5	3	7	6	5	10	2	0	0	0
Texas	41	15	20	285	216	216	22	28	29	4	2	2
MOUNTAIN												
Montana	2	15	2	3	------	------	24	0	9	0	0	0
Idaho	3	0	0	6	------	------	20	0	1	0	0	0
Wyoming	0	0	0	------	------	------	1	0	0	0	0	0
Colorado	1	4	4	4	27	11	5	0	14	2	0	0
New Mexico	2	5	1	2	------	------	2	2	4	0	0	0
Arizona	2	0	0	12	12	30	0	2	4	0	0	0
Utah [2]	0	0	0	------	------	1	43	7	7	0	0	0
Nevada	0	0	0	------	1	------	0	4	0	0	0	0
PACIFIC												
Washington	2	5	2	------	1	------	30	32	17	2	3	1
Oregon	2	0	1	3	5	4	9	18	16	1	1	1
California	15	15	10	10	28	16	129	150	62	4	12	2
Total	284	205	205	649	491	491	662	668	668	59	123	41
35 weeks	8,894	7,212	7,871	72,310	339,669	169,989	102,559	592,322	539,146	6,326	13,371	2,495

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended September 1, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944		Sept. 1, 1945	Sept. 2, 1944	
NEW ENGLAND												
Maine	3	1	1	5	10	3	0	0	0	1	0	1
New Hampshire	3	11	1	9	0	2	0	0	0	0	0	0
Vermont	5	7	0	0	0	1	0	0	0	0	1	0
Massachusetts	32	35	20	29	32	47	0	0	0	38	2	3
Rhode Island	0	1	1	2	2	3	0	0	0	2	1	0
Connecticut	20	20	6	7	10	8	0	0	0	2	2	2
MIDDLE ATLANTIC												
New York	138	666	58	73	56	56	0	0	0	10	16	13
New Jersey	96	67	21	18	15	19	0	0	0	5	3	4
Pennsylvania	61	162	13	41	34	41	0	0	0	11	3	18
EAST NORTH CENTRAL												
Ohio	33	105	21	44	50	50	1	0	0	6	13	13
Indiana	22	27	7	11	11	11	0	0	0	3	4	4
Illinois	94	37	36	37	18	43	0	0	0	2	3	10
Michigan [2]	13	120	26	32	26	31	0	0	0	3	2	6
Wisconsin	15	32	18	47	27	30	0	0	0	0	2	1
WEST NORTH CENTRAL												
Minnesota	9	40	11	15	11	15	0	0	0	0	0	0
Iowa	31	7	7	5	6	13	0	0	0	2	1	1
Missouri	29	11	11	14	11	11	0	0	0	4	11	9
North Dakota	0	4	1	10	2	2	1	0	0	0	1	0
South Dakota	4	0	1	2	0	9	0	0	0	1	1	0
Nebraska	9	7	7	2	7	3	0	0	0	0	0	0
Kansas	15	8	8	30	23	20	0	0	0	1	5	5
SOUTH ATLANTIC												
Delaware	4	4	0	2	2	2	0	0	0	1	0	0
Maryland [2]	3	47	2	9	14	9	0	0	0	2	2	2
District of Columbia	8	22	0	0	2	4	0	0	0	1	0	1
Virginia	32	65	5	17	11	7	0	0	0	3	5	5
West Virginia	1	14	6	23	36	21	0	0	0	8	4	6
North Carolina	10	41	3	38	27	23	0	0	0	1	7	9
South Carolina	12	4	1	6	2	4	0	0	0	6	2	4
Georgia	6	8	3	7	6	6	1	2	0	7	6	8
Florida	4	2	2	3	1	2	0	0	0	2	2	3
EAST SOUTH CENTRAL												
Kentucky	2	34	10	22	13	17	0	0	0	7	7	15
Tennessee	23	5	4	29	9	10	0	0	0	12	1	15
Alabama	2	2	3	7	6	20	0	0	0	3	1	6
Mississippi [2]	3	7	3	8	7	6	0	0	0	1	3	11
WEST SOUTH CENTRAL												
Arkansas	4	3	3	0	3	3	0	0	0	2	9	9
Louisiana	7	1	1	1	1	2	0	0	0	3	1	7
Oklahoma	16	2	2	4	3	5	0	0	0	2	3	6
Texas	33	8	8	43	20	17	0	0	0	17	17	17
MOUNTAIN												
Montana	0	0	3	6	4	8	0	0	0	4	0	1
Idaho	3	1	1	3	3	3	0	0	0	1	0	0
Wyoming	2	0	0	3	0	1	0	0	0	0	0	0
Colorado	15	5	3	10	10	10	0	0	0	4	0	0
New Mexico	0	1	1	2	3	3	0	0	0	3	2	2
Arizona	1	1	1	2	1	1	0	0	0	3	3	3
Utah [2]	34	2	3	0	4	2	0	0	0	0	0	0
Nevada	0	2	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	22	12	12	15	21	9	0	0	0	2	0	3
Oregon	5	11	5	8	7	7	0	0	0	0	2	1
California	*33	10	12	81	87	39	0	0	0	7	1	2
Total	917	1,682	620	782	654	654	3	2	7	193	149	231
35 weeks	*6,156	9,474	4,026	136,195	148,893	99,317	273	307	621	3,111	3,596	4,498

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: Massachusetts 37; Rhode Island 2; Connecticut 1; New Jersey 2; South Carolina 3; Georgia 1; Texas 2; Colorado 2; New Mexico 1; California 3.

*Correction: California, week ended Aug. 11, poliomyelitis 40 (instead of 10).

Telegraphic morbidity reports from State health officers for the week ended September 1, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Sept. 1, 1945	Whooping cough: Week ended— Sept. 2, 1944	Whooping cough: Median 1940–44	Week ended Sept. 1, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	16	20	20	0	0	0	0	0	0	0	0
New Hampshire	2	0	0	0	0	0	0	0	0	0	1
Vermont	14	9	16	0	0	0	0	0	0	0	3
Massachusetts	131	69	72	0	39	0	0	0	0	0	0
Rhode Island	18	6	6	0	3	0	0	0	0	0	0
Connecticut	45	30	30	1	1	0	1	0	0	0	2
MIDDLE ATLANTIC											
New York	293	183	258	6	16	0	1	2	0	0	8
New Jersey	138	61	88	0	1	0	0	0	0	0	1
Pennsylvania	135	79	180	0	0	0	0	1	0	0	3
EAST NORTH CENTRAL											
Ohio	141	119	144	0	2	0	0	0	0	0	1
Indiana	9	2	19	1	0	0	1	0	0	0	0
Illinois	70	68	156	5	0	0	2	1	1	0	8
Michigan [2]	142	61	221	2	0	0	0	0	0	0	1
Wisconsin	51	120	208	0	0	0	0	0	0	0	3
WEST NORTH CENTRAL											
Minnesota	7	41	41	2	0	0	0	0	0	0	2
Iowa	10	10	23	5	0	0	0	0	0	0	2
Missouri	17	16	8	0	0	2	0	2	1	0	0
North Dakota	4	39	13	0	0	0	0	0	0	0	0
South Dakota	6	4	4	0	0	0	0	0	0	0	0
Nebraska	2	3	3	0	0	0	0	0	0	0	0
Kansas	50	38	38	1	0	0	1	0	1	0	1
SOUTH ATLANTIC											
Delaware	1	0	3	0	0	0	0	0	0	0	0
Maryland [2]	45	46	56	0	0	0	0	0	0	0	0
District of Columbia	8	0	10	0	0	0	0	0	0	0	0
Virginia	23	23	23	0	0	295	0	1	2	0	0
West Virginia	23	12	17	0	0	0	0	0	0	0	0
North Carolina	147	95	95	1	0	0	0	2	1	4	0
South Carolina	62	70	58	2	24	0	0	0	0	16	0
Georgia	21	2	13	1	5	3	0	0	1	37	5
Florida	3	19	19	1	0	0	0	0	0	14	1
EAST SOUTH CENTRAL											
Kentucky	36	34	34	0	0	0	0	0	0	0	0
Tennessee	28	15	27	0	0	3	0	1	2	1	2
Alabama	3	6	18	0	0	0	0	0	0	19	3
Mississippi [2]	------	------	------	0	0	0	0	0	1	5	1
WEST SOUTH CENTRAL											
Arkansas	10	8	8	0	14	0	0	0	2	0	1
Louisiana	1	1	1	2	0	0	0	0	0	9	3
Oklahoma	20	7	7	1	9	0	0	4	0	0	2
Texas	125	170	142	12	423	4	0	0	0	45	10
MOUNTAIN											
Montana	2	21	17	0	0	0	0	0	0	0	0
Idaho	1	1	1	0	7	0	0	0	0	0	0
Wyoming	5	1	2	0	0	0	0	0	0	0	0
Colorado	33	34	32	0	0	0	0	0	0	0	0
New Mexico	9	0	7	0	13	7	0	0	0	0	0
Arizona	4	26	13	0	0	26	0	0	0	0	0
Utah [2]	35	24	36	0	0	0	0	0	1	0	2
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	36	19	36	0	0	0	0	0	0	0	1
Oregon	12	4	19	0	0	0	0	0	0	0	1
California	130	74	135	2	6	0	29	0	0	0	4
Total	2,124	1,690	2,536	45	563	340	35	14	13	150	72
Same week, 1944	1,690	------	------	39	617	218	41	8	11	157	52
Average, 1942–44	2,373	------	------	34	427	210	29	[4] 10	8	[4] 126	------
35 weeks: 1945	88,869	------	------	1,274	17,223	6,983	337	386	539	3,049	3,253
1944	66,648	------	------	1,179	15,160	5,640	442	389	397	3,091	2,459
Average, 1942–44	110,707	------	[4] 128,043	1,129	10,772	5,190	426	[4] 389	563	[4] 2,098	------

[2] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.

Leprosy: New Jersey 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended August 25, 1945

This table lists the reports from 84 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	0	3	0	0	8
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	10	0	2	16	8	0	0	52
Springfield	0	0	------	0	0	0	0	2	1	0	1	4
Worcester	0	0	------	0	6	0	5	0	0	0	0	3
Rhode Island:												
Providence	0	1	------	0	0	0	0	0	3	0	1	5
Connecticut:												
Bridgeport	0	0	------	0	0	0	1	1	2	0	0	0
Hartford	0	0	------	0	2	0	0	0	1	0	0	1
New Haven	0	0	------	0	0	0	1	2	0	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	3	8	6	0	0	12
New York	6	3	1	0	17	10	27	78	25	0	10	199
Rochester	0	0	------	0	0	0	3	11	3	0	1	3
Syracuse	0	0	------	0	0	0	1	0	5	0	0	31
New Jersey:												
Camden	0	0	------	0	0	0	1	1	3	0	1	0
Newark	0	0	------	0	2	1	4	3	2	0	0	22
Trenton	0	0	------	0	0	0	1	15	0	0	1	11
Pennsylvania:												
Philadelphia	1	0	------	0	12	2	16	25	7	0	2	72
Pittsburgh	0	0	1	1	1	1	3	6	10	0	1	12
Reading	0	0	------	0	0	0	0	0	0	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	3	1	7	5	13	0	1	13
Cleveland	2	0	------	0	0	3	5	7	1	0	0	51
Columbus	1	0	------	0	1	0	3	0	4	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	0	0	2	0	0	0	0	2
Indianapolis	1	0	------	0	1	0	3	3	3	0	0	19
South Bend	0	0	------	0	0	0	0	0	0	0	0	2
Terre Haute	1	0	------	0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	1	0	------	0	40	1	16	33	23	0	2	80
Springfield	0	0	------	0	0	0	0	0	1	0	0	0
Michigan:												
Detroit	4	0	------	0	10	1	6	3	11	0	3	86
Flint	0	0	------	0	0	0	1	0	1	0	0	0
Grand Rapids	0	0	------	0	1	0	0	0	0	0	0	3
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	4	1	1	2	3	0	0	13
Racine	0	0	------	0	1	0	1	0	0	0	0	7
Superior	0	0	------	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	1	0	0	0	0	0
Minneapolis	0	0	------	0	0	0	0	10	8	0	0	2
St. Paul	2	0	------	0	0	1	1	0	1	0	0	25
Missouri:												
Kansas City	0	0	------	0	0	2	5	0	3	0	0	3
St. Joseph	0	0	------	0	0	0	0	0	0	0	0	0
St. Louis	0	1	------	1	1	0	6	4	6	0	2	28

City reports for week ended August 25, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	1	0	1	0	4	0	0	0
Nebraska:												
Omaha	2	0		0	0	0	1	2	3	0	0	0
Kansas:												
Topeka	1	0		0	0	0	0	0	3	0	0	1
Wichita	0	0		0	2	0	1	0	5	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	0	2	0	0	0	0	3
Maryland:												
Baltimore	8	0		0	1	1	4	3	4	0	0	60
Frederick	0	0		0	0	0	0	0	1	0	0	0
District of Columbia:												
Washington	0	0		0	0	0	4	17	10	0	1	5
Virginia:												
Richmond	0	0		0	0	1	0	24	3	0	3	6
Roanoke	0	0		0	0	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0		0	0	0	0	0	1	0	0	0
Wheeling	0	0		0	0	0	2	0	1	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	0	0	0	0	0	3
Winston-Salem	0	0		0	0	0	0	1	1	0	0	8
South Carolina:												
Charleston	0	0		0	0	0	1	0	0	0	0	0
Georgia:												
Atlanta	0	0		0	1	0	3	0	1	0	0	0
Brunswick	0	0		0	0	0	0	0	0	0	0	0
Savannah	0	0		0	0	0	3	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0		0	0	0	10	0	0	0	1	1
Nashville	0	0		0	0	0	0	1	0	0	0	0
Alabama:												
Birmingham	0	0	1	0	0	0	2	4	0	0	0	0
Mobile	0	0		0	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	0	0	0	0	0	1
Louisiana:												
New Orleans	4	0	4	0	4	0	9	2	0	0	2	4
Shreveport	0	0		0	0	0	3	2	4	0	0	0
Texas:												
Dallas	4	0		0	4	0	3	5	4	0	0	4
Galveston	4	0		0	0	0	0	0	0	0	0	0
Houston	1	0		0	0	0	3	6	1	0	0	0
San Antonio	0	1		0	0	0	6	2	0	0	0	5
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	0	0	0	0	1	0
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	0
Missoula	0	0		0	0	0	0	1	0	0	0	0
Idaho:												
Boise	0	0		0	0	0	2	0	0	0	0	0
Colorado:												
Denver	1	0	1	0	1	0	6	9	1	0	0	25
Pueblo	0	0		0	0	0	1	0	0	0	0	2
Utah:												
Salt Lake City	0	0		0	4	0	1	5	3	0	0	6

City reports for week ended August 25, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza: Cases	Influenza: Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	0	0		0	5	1	6	1	0	0	0	4
Spokane	2	0		0	0	0	0	0	0	0	0	0
Tacoma	0	0		0	12	0	0	0	0	0	0	1
California:												
Sacramento	0	0		0	7	0	1	1	2	0	0	0
San Francisco	4	0		0	20	1	8	1	7	0	0	4
Total	51	6	8	3	175	28	210	322	217	0	34	917
Corresponding week, 1944	34		8	6	102		208		162	0	35	516
Average, 1940-44	36		22	[1] 7	[2] 206		[1] 216		177	0	37	929

[1] 3-year average, 1940-42. [2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: Philadelphia, 1: Chicago, 1: Detroit, 1; St. Louis, 1.
Dysentery, bacillary.—Cases: New Haven, 1; New York, 2; Charleston, S. C., 4; Atlanta, 1: Great Falls, 3.
Dysentery, unspecified.—Cases: Richmond, 1; San Antonio, 8.
Rocky Mountain spotted fever.—Cases: Richmond, 2.
Typhus fever, endemic.—Cases: New York, 2; Winston-Salem, 1: Charleston, S. C., 5: Atlanta, 4: Savannah, 3; Nashville, 1: Birmingham 2; New Orleans, 5; Shreveport, 1; Houston, 8; San Antonio, 5.

Rates (annual basis) per 100,000 population, by geographic groups, for the 84 cities in the preceding table (estimated population, 1943, 32,339,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza: Case rates	Influenza: Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	2.8	2.8	0 0	0 0	50	0.0	27.6	58.0	53	0.0	5.5	213
Middle Atlantic	3.2	1.4	0.9	0.5	15	6.5	27.3	68.0	28	0.0	7.4	168
East North Central	6.1	0.0	0.0	0.6	37	4.3	27.4	32.2	36	0.0	3.6	171
West North Central	9.9	2.0	0.0	2.0	10	6.0	31.8	31.8	66	0.0	4.0	107
South Atlantic	14.1	0.0	0.0	0.0	4	3.5	33.6	79.6	39	0.0	7.1	150
East South Central	0.0	0.0	5.9	0.0	0	0.0	70.8	29.5	0	0.0	5.9	6
West South Central	37.3	2.9	11.5	0.0	23	0.0	68.9	48.8	26	0.0	5.7	40
Mountain	7.9	0.0	7.9	0.0	40	0.0	79.4	119.1	32	0.0	7.9	262
Pacific	19.6	0.0	0.0	0.0	144	6.5	49.0	10.0	29	0.0	0.0	29
Total	8.2	1.0	1.3	0.5	28	4.5	34.0	52.1	35	0.0	5.5	148

PLAGUE INFECTION IN ALPINE AND KERN COUNTIES, CALIF.

Under date of August 23, 1945, plague infection was reported proved in specimens as follows: In tissue from 1 ground squirrel, *C. beldingi*, shot at Hope Valley, Alpine County, Calif., 6 miles west of Woodfords on Carson Pass Highway No. 88, proved positive on August 16; in tissue from 2 ground squirrels, same species, shot at same location, proved positive on August 21; and in a pool of 200 fleas from 34 ground squirrels, *C. beecheyi*, shot on the east side of Castair Lake, Kern County, Calif., proved positive on August 21.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 11, 1945.—During the week ended August 11, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		24	48	3	14	50	28	168
Diphtheria		3	5	19	4	6		4		41
Dysentery, bacillary				2		1			1	4
German measles					9			12	4	25
Influenza		4			9	1			5	19
Measles		1	1	15	79	4	5	16	28	149
Mumps				15	30	18	3	13	7	86
Poliomyelitis		1			[1] 16				2	[1] 19
Scarlet fever		2	7	23	29	5	2	6	4	78
Tuberculosis (all forms)		6	16	48	51	19	13	71		224
Typhoid and paratyphoid fever			1	4				1	3	9
Undulant fever				8		1		1	2	7
Venereal diseases:										
Gonorrhea		12	38	145	142	58	31	44	122	592
Syphilis		9	5	118	62	10	6	8	39	257
Whooping cough		7		77	32		1	14		131

[1] Includes 2 cases, delayed reports.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Plague

Great Britain—Malta.—For the week ended August 18, 1945, 3 cases of plague were reported in Malta, Great Britain.

Morocco (French).—For the period August 11–20, 1945, 50 cases of plague were reported in French Morocco.

Peru.—For the month of July 1945, plague was reported in Peru by Departments as follows: Ica, 1 case; Libertad, 1 case; Lima, 2 cases. Plague infection in rodents was also reported in Huacho and Chuquizongo, Peru.

Smallpox

British East Africa—Tanganyika.—For the week ended July 28, 1945, 181 cases of smallpox with 9 deaths were reported in Tanganyika, British East Africa.

Ceylon.—For the period July 28 to August 12, 1945, 95 cases of smallpox with 15 deaths were reported in Ceylon.

Rhodesia, Northern.—For the week ended July 28, 1945, 482 cases of smallpox were reported in Northern Rhodesia.

Uruguay.—For the month of July 1945, 86 cases of smallpox, including 19 cases previously reported, were reported in Uruguay.

Typhus Fever

Egypt.—For the week ended August 4, 1945, 116 cases of typhus fever with 32 deaths were reported in all of Egypt.

Morocco (French).—For the period August 11–20, 1945, 106 cases of typhus fever were reported in French Morocco, including 1 case reported in Casablanca.

Turkey.—For the week ended August 25, 1945, 27 cases of typhus fever were reported in Turkey, including 2 cases reported in Ankara and 2 cases in Istanbul.

Yellow Fever

Gold Coast—Winneba.—Yellow fever was reported in Winneba, Gold Coast, as follows: August 8, 1945, 1 suspected case; August 22, 1945, 1 new case.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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THE CHEMOTHERAPEUTIC ACTION OF STREPTOMYCIN AND PROMIN[1] IN EXPERIMENTAL TUBERCULOSIS[2]

By M. I Smith, *Chief Pharmacologist*, and W. T. McClosky, *Pharmacologist*, *United States Public Health Service*

INTRODUCTION

Probably the first recorded antibiotic against the tubercle bacillus was the report by Vaudremer in 1912 (*1*) to the effect that cultures and mycelium of *Aspergillus fumigatus* contained a thermostable substance capable of inactivating tuberculin. In 1913 the same author reported rendering human tubercle bacilli nonpathogenic for guinea pigs by incubating a bacillary suspension at 37° C. with an extract of the filtrate of *A. fumigatus*. The recent advances in chemotherapy of bacterial infections with penicillin stimulated the search for antibiotics against the tubercle bacillus. In 1944 Smith and Emmart (*2*) reported a tuberculostatic action in vitro and a slightly favorable effect in infected guinea pigs from preparations obtained by continuous ether extraction of culture filtrates of *Penicillium notatum* grown on Raulin-Thom medium. Later Soltys (*3*) confirmed and extended Vaudremer's observations concerning an antibiotic against the tubercle bacillus derived from *A. fumigatus*, and in 1945 Asheshov and Strelitz (*4*) reported some progress on the isolation of the active component. In like manner active substances have been obtained recently from *Aspergillus flavus* (*5*) and *Aspergillus ustus* (*6*).

The systematic researches by Waksman and associates led to the isolation from *Actinomyces griseus* of an active substance designated streptomycin (*7*) with antibiotic properties against the tubercle bacillus (*8*). The pharmacologic properties of this substance have been studied by Robinson and associates (*9*) who showed that it was well tolerated by mice and rats in doses of 50,000 units per kg. of body weight daily when given parenterally over a period of 1 month.

[1] Sodium p-p' diaminodiphenylsulfone N-N' didextrose sulfonate

[2] From the Division of Physiology, National Institute of Health.

A sample of this material obtained in October 1944 through the courtesy of Dr. E. F. Robertson, Merck & Co., was tested for tuberculostatic action in vitro with good results, the minimal effective concentration being 100 units percent or approximately 0.3 mg. percent. Subsequent experiments to determine the effect of streptomycin on the incidence and extent of tubercle formation on the chorioallantois also gave results of sufficient promise to warrant an investigation of its action in experimental tuberculosis in animals.[3]

The first of the chemotherapeutic tests was made in February 1945. This was limited in scope since the material available at that time was barely sufficient to treat four guinea pigs for a period of about 30 days. In the meantime a favorable preliminary report appeared by Feldman and Hinshaw (*10*) in which they concluded that streptomycin is capable of exerting "a striking suppressive effect on the pathogenic proclivities in guinea pigs of the human variety of *Mycobacterium tuberculosis*." As additional supplies of the material became available through the cooperative efforts of the Subcommittee on Chemotherapy of the National Research Council and Merck & Co., more comprehensive studies were undertaken to ascertain the chemotherapeutic possibilities of streptomycin in experimental tuberculosis.

EXPERIMENTAL

Two series of experiments were made in guinea pigs infected with tuberculosis: the first to determine if streptomycin had any ameliorating effect; the second to ascertain its value as compared with promin, a sulfone derivative which has received considerable attention in recent years (*11, 12, 13*); and further to explore the possibilities of potentiation by combined treatment with two chemotherapeutic agents of diverse chemical constitution and with probably different mechanisms of action.

In the first series there were eight male guinea pigs weighing about 250 to 300 gm. They were inoculated intraperitoneally on February 9, 1945, with 1 cc. of a suspension containing 1 mg. moist weight of a human strain tubercle bacilli (A27, Henry Phipps Institute). Four of the animals served as controls and four were treated daily with 5,000 units streptomycin injected intramuscularly, beginning February 12 and extending to March 16. Little was known at the time regarding tolerance of guinea pigs for streptomycin or about absorption, retention, and elimination. This technique of treatment was adopted because it appeared to give satisfactory results, and has been used throughout. Ten days after the last treatment, or 45 days subsequent to infection, the animals were killed with chloroform, autopsied,

[3] The details of this work will be published in a separate communication by E. W. Emmart: The tuberculostatic action of streptothricin and streptomycin with special reference to the action of streptomycin on the chorioallantoic membrane of the chick embryo.

and the extent of tuberculous involvement noted and recorded according to procedures previously described (*14*).

In the second series there were 81 male guinea pigs of as uniform weight as possible (range 270 to 370 gm.). These were inoculated as in the preceding series, on April 12, 1945, and were divided into 4 groups as follows: 20 controls; 21 for treatment with streptomycin, 5,000 units intramuscularly daily; 20 for treatment with promin, 0.5 gm. per kg. daily per os; 20 for treatment with streptomycin intramuscularly and promin orally as in the preceding series.

The animals were weighed weekly. Treatment was begun the day after inoculation and continued for 3 months, until July 11. Sixty days after infection hemoglobin determinations were made to ascertain the effects of individual and combined treatments, since, as is well known, promin may induce anemia in experimental animals at the dose level administered (*12, 15*). At 70 days post infection blood levels for promin were determined in groups 3 and 4, using 5 animals in each of the groups at 3, 5, and 21 hours, respectively, following drug administration. Two cubic centimeters of blood was taken by cardiac puncture in each case, and blood levels determined electrophotometrically using the Bratton and Marshall method (*16*). At 76 to 92 days post infection all the survivors were tuberculin tested using 0.01 mg. PPD in 0.1 cc. intracutaneously, and the relative response in each of the groups evaluated in terms of (*a*) no discernible reaction, (*b*) doubtful reaction, (*c*), moderate, and (*d*) severe reaction with edema and some central necrosis. Finally at 105 to 110 days post infection, when 65 percent of the controls had died, the experiment was terminated, the animals killed with chloroform, and the incidence and extent of tuberculous involvement noted.

RESULTS

The findings in the first series of experiments in which treatment was continued for a little over 30 days and the experiment terminated 45 days after infection are summarized in figure 1. The average gain in weight for the controls during the experimental period was 86 gm., for the treated 140 gm. The average tuberculosis index for the treated group was 3.5 as against 9.5 for the controls. A breakdown of the extent of tuberculosis in the several organs most commonly involved indicates a high degree of protection of the peritoneum, liver, lungs, and spleen. The liver and lungs of only one of the treated animals showed slight to moderate degree of involvement, while all the controls had a considerable degree of tuberculosis in these organs. The peritoneum [4] was heavily involved in the controls but entirely free of infection in the treated group. In like manner

[4] The extent of tuberculous involvement of the kidneys, intestines, mesenteric glands, and testicles was rated with and included in that of the peritoneum.

there was a considerable degree of protection in the spleen, but apparently none in the omentum. It would appear that with treatment instituted 3 days after infection and continued for a period of 30 days, complete protection could not be attained since all the treated animals showed some degree of tuberculous involvement, but it was possible so to retard the progress of the disease as to reduce materially the dissemination of the tuberculous process and leave the peritoneum free of disease in all of the animals, the lungs and liver in three of the animals, and the spleen in two.

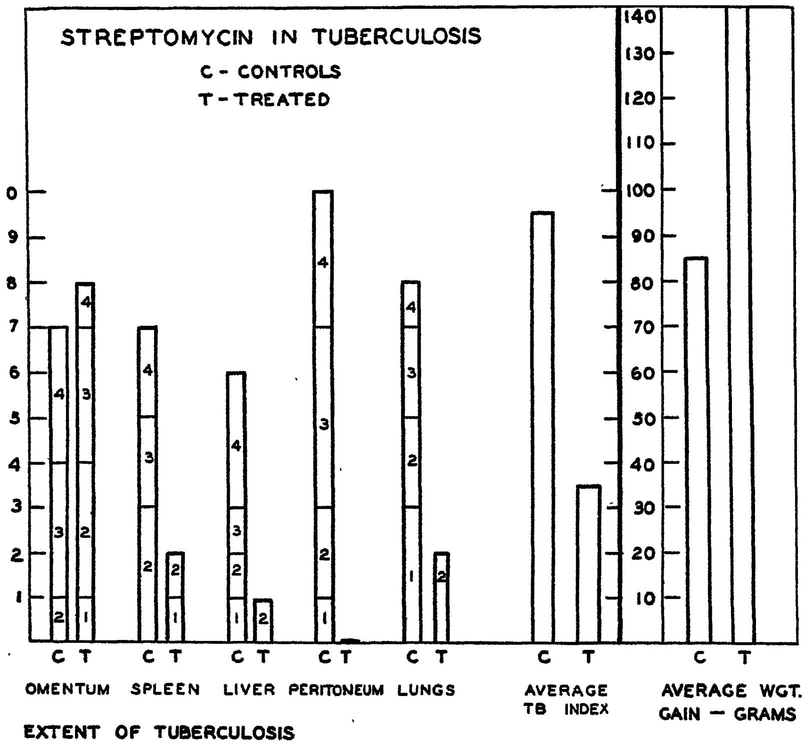

FIGURE 1.—The effect of treatment of experimentally infected guinea pigs with 5,000 units streptomycin injected intramuscularly daily. Treatment continued 32 days and experiment terminated 45 days after infection.

Results of the second series of experiments are presented in the following tables. Hemoglobin determinations made 60 days after infection and continuous treatment (summarized in table 1) indicate no deleterious effect from streptomycin. On the contrary, there was some degree of protection against the low grade of anemia incidental to the disease as well as against the anemia which may result from promin administration. There was an incidence of 24 and 36 percent for the controls and promin groups respectively in the low hemoglobin group, none in the streptomycin, and only 5 percent in the combined

TABLE 1.—*Hemoglobin levels in guinea pigs infected with human strain tubercle bacilli and treated continuously for 60 days*

Hemoglobin	Controls	Streptomycin-treated guinea pigs	Promin-treated guinea pigs	Streptomycin+promin-treated guinea pigs
Grams per 100 c. c.	*Percent*	*Percent*	*Percent*	*Percent*
11-13	24	0	36	5
13-15	40	40	52	58
15-17	36	60	12	37

treatment group. All of the streptomycin-treated animals and 95 percent of the combined-treatment group had adequate hemoglobin levels.

Blood level determinations for promin after 70 days of continuous treatment showed no untoward effects from the combined treatment. Actually, the promin levels determined at different times following the last dose were somewhat higher in the combined-treatment group than in the group receiving promin alone. This is summarized in table 2.

TABLE 2.—*Blood levels of promin after 70 days of continuous treatment in guinea pigs infected with human strain tubercle bacilli* [1]

Hours after last dose	Promin (mg. per 100 cc.)	
	Promin-treated guinea pigs	Promin+streptomycin-treated guinea pigs
3	12.0	15.2
5	12.8	15.2
21	0.5	2.0

Each figure represents the average of 5 animals.

The incidence of intracutaneous tuberculin reactions in the several groups is summarized in table 3. All the surviving animals of the four groups were subjected to the test. Two of the controls died within 48 hours and both showed extensive tuberculosis. All of the remaining

TABLE 3.—*Percentage incidence of tuberculin reactions in the several groups of guinea pigs tested at 76 to 92 days post infection with human strain tubercle bacilli* [1]

	Controls	Streptomycin-treated guinea pigs	Promin-treated guinea pigs	Streptomycin + promin-treated guinea pigs
	Percent	*Percent*	*Percent*	*Percent*
Number tested	12	21	17	20
Percent mortality	16	0	0	0
Percent showing:				
No reaction	0	0	30	25
Doubtful reaction	0	0	58	25
Positive reaction	42	57	6	35
Severe reaction	42	43	6	15

[1] 0.01 mg. PPD injected intracutaneously.

controls gave moderate to severe reactions, as did all of the streptomycin group. Eighty-eight percent of the promin group and 50 percent of the combined-treatment group failed to react or at best gave a doubtful reaction. Attempts to correlate these findings with post-mortem findings 20 to 30 days later, when the experiment was terminated, failed to show a definite relationship between the extent of tuberculous involvement and the severity of the tuberculin reaction. Thirteen animals in the combined-treatment group showed no gross evidence of tuberculous involvement and 8 of them gave a positive tuberculin reaction, while in the promin group 15 of the animals that failed to react to tuberculin showed gross evidence of tuberculosis, the tuberculosis index range in this group being from 1 to 9. The evidence strongly suggests the possibility that treatment with promin suppresses the tuberculin reaction. The chemotherapeutic significance of this remains to be determined.

Tables 4 and 5 summarize the status and autopsy findings at the time the experiment was terminated, from 105 to 110 days post infection. Sixty-five percent of the controls and 15 percent in the promin group

TABLE 4.—*Summary of findings at termination of experiment, 105 to 110 days after infection with human strain tubercle bacilli*

	Controls	Streptomycin	Promin	Streptomycin + promin
Mortality percent	65	0	15	0
Number losing weight	[1]4/7	[1]1/21	[1]2/17	[1]0/20
Average gain in weight, gm	99	298	183	252
Weight of spleens, gm:				
Range	1.5–28.8	0.6–1.7	0.9–2.7	0.6–1.3
Average	5.0	1.0	2.0	1.0
Tuberculosis index:				
Range	5–15	0–4	1–11	0–2
Average	10.0	1.9	4.1	0.5
Percent of animals with doubtful lesions or none.	0	15	5	65

[1] Numerator=number losing weight; denominator=number surviving.

TABLE 5.—*Extent and distribution of lesions (tuberculosis index) in the several tissues and organs*

Tissue	Controls	Streptomycin	Promin	Streptomycin +promin
Omentum and lymph nodes:				
Range	0–3	0–1	0–2	0–1
Average	1.0	0.7	0.6	0.1
Spleen:				
Range	0–4	0–1	0–3	0
Average	1.8	0.1	0.6	0
Liver:				
Range	1–4	0–1	0–3	0–1
Average	2.2	0.3	0.6	0.1
Peritoneum (including kidneys, intestine and testicles):				
Range	0–4	0–2	0–3	0–1
Average	2.6	0.7	1.1	0.1
Lungs:				
Range	1–4	0	0–3	0
Average	2.6	0	1.1	0

were dead, all the animals in the streptomycin and streptomycin + promin groups were alive and well. Four of the seven surviving controls were losing weight and were definitely on the decline; no serious losses of weight were seen in any of the surviving animals in the three treated groups. The average gain in weight since the time of infection was 99 gm. for the controls, 183 gm. for the promin group, 298 gm. for the streptomycin, and 252 gm. for the combined-treatment group. The average weight of the spleens of all the controls was 5.0 gm; for the promin group 2.0 gm.; and only 1.0 gm. for each of the streptomycin and the streptomycin + promin groups. The average tuberculosis index rated by procedures previously described (*14*) was 10.0 for the controls; 4.1 for the promin group; 1.9 for the streptomycin group; and only 0.5 for the combined-treatment group. All but one of the controls surviving 30 days or longer had moderate to extensive tuberculous involvement,[5] one of the animals in the promin group showed no gross evidence of infection, 3 in the streptomycin group were free of macroscopic lesions, and 13 or 65 percent of the combined-treatment group appeared free from all discernible lesions. The remaining 7 animals in this last group had a minimal amount of tubuerculosis with a rating of 1 in 5 animals and 2 in 2 of the animals. The lesions in these 7 animals usually consisted of a small localized tuberculous abscess of the small intestine or of a few miliary nodules in the testicles. In only 1 of the animals were the lymph nodes in the omentum enlarged and caseating. The spleens, livers, and lungs were free of grossly visible lesions in all the animals, and there was no involvement in the kidneys or peritoneum in any of them.

The essential data are presented in graphic form in figure 2, in which the tuberculosis index for the experimental groups is expressed on the basis of 100 for the controls.

COMMENT

The data presented in this report leave no doubt that streptomycin is a highly effective chemotherapeutic agent in checking and retarding the normal course of tuberculosis infection in guinea pigs. Under the experimental conditions of treatment 5,000 units streptomycin (approximately 10,000 to 15,000 units per kg.) injected intramuscularly daily for a period of 90 days produced a definitely greater chemotherapeutic effect than promin given in doses of 0.5 gm. per kg. daily for an equal length of time. Since the dose of promin used is about one-half the maximum tolerated dose of this drug (*12*) while the dose of streptomycin used is less than 1/20 its maximum tolerated dose [6] it follows

[5] One of the controls had a rating of 1, with a moderate degree of tuberculosis in the testicles and few miliary tubercles in the liver.

[6] Ten guinea pigs receiving a single intramuscular injection of 300,000 units per kg. survived, of 10 guinea pigs receiving 400,000 units per kg. 5 died. Three groups of guinea pigs, 3 each, receiving daily doses of 50,000, 75,000, and 100,000 units per kg. over a period of 10 days failed to show evidence of toxicity other than some depression of normal growth.

that streptomycin has a chemotherapeutic index better than 10 times that of promin, which heretofore has been probably the most effective chemotherapeutic agent in experimental tuberculosis when viewed in the light of relative safety, effectiveness, ease of administration, and freedom from toxic side actions. Neither of these chemotherapeutic agents when used individually has so far completely eradicated the disease process. Streptomycin is still too new and inadequately studied a drug to rule out the possibility of better chemotherapeutic effects (even to the point of completely eradicating the disease) with

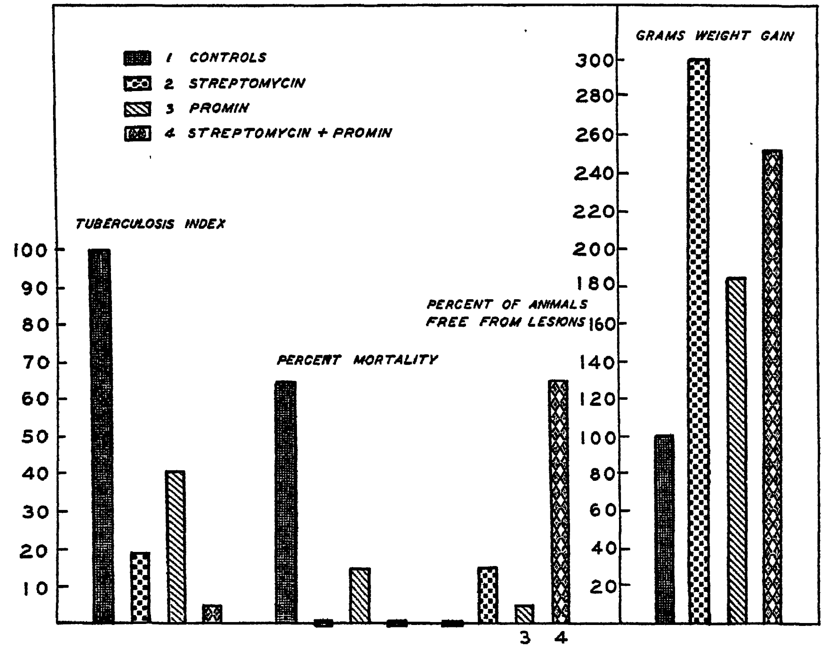

FIGURE 2.—Chemotherapeutic effect of streptomycin, promin, and a combination of the two drugs in experimental tuberculosis in guinea pigs.

the application of larger doses and better methods of administration. Enough is known about promin to enable us to state definitely that under our rigorous experimental conditions little more can be attained with this drug alone. It is significant that by the application of a suitable combination of the two chemotherapeutic agents, streptomycin and promin, we have not only been able to get better results than with either alone, but we have been able to obtain results unlike anything we have obtained heretofore in the treatment of experimental tuberculosis infections.

The results of treatment with the combination of streptomycin and promin appear to indicate a synergistic action rather than simple summation of effects. Taking into consideration the tuberculosis index data given in table 4 the chemotherapeutic efficacy of streptomycin

may be expressed numerically as 5.2 (10.0/1.9). In like manner the chemotherapeutic efficacy of promin may be expressed as 2.4 (10.0/-4.1). Simple summation of effects should give a chemotherapeutic efficacy of 7.6 for the combined treatment group. Actually the chemotherapeutic efficacy for this group was 20 (10.0/0.5), nearly three times as much as would be anticipated from simple summation. Comparison of effects by other criteria listed in table 4 points in the same direction of potentiation rather than summation.

If the experimental approach we have used is any criterion of chemotherapeutic effectiveness in man we believe our experimental results warrant the cautious application of the combined treatment in suitable clinical cases, while the search for more effective sulfones and for better methods of streptomycin administration continues.

SUMMARY

The daily intramuscular injection of 5,000 units of streptocmycin for a period of 90 days in guinea pigs infected with a human strain of tubercle bacilli has produced a chemotherapeutic effect superior to that obtained with 0.5 gm. per kg. promin given orally for the same length of time. Since the dose of promin used is about half the maximum tolerated dose while streptomycin is less than one-twentieth it appears that streptomycin has a chemotherapeutic index better than 10 times that of promin. It also seems possible that by increasing the dose of streptomycin and with better methods of administration its chemotherapeutic effectiveness may be enhanced. Using a suitable combination of streptomycin and promin it was possible to obtain results which, under our experimental conditions, have not been obtained previously.

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AN OUTBREAK OF FOOD POISONING DUE TO A NEW ETIOLOGICAL AGENT—*SALMONELLA BERTA* [1]

By George H. Hauser, M. D.,[2] W. L. Treuting, M. D., M. P. H.,[3] and L. A. Breiffelh, M. D.[4]

In recent years several new strains of *Salmonella* have been described. In 1936, Hormaeche and Salsamendi (*1*) in Montevideo, Uruguay, studying the bacterial flora of various organs of the normal hog, isolated from the mesenteric glands a new strain which they named *Salmonella berta.* These workers found the organism to be pathogenic for certain animals. However, review of the literature has failed to disclose any report of the organism having produced disease in humans.

This is an account of an outbreak of food poisoning in which pork sausage was found to be the contaminated food and *S. berta* the causative organism. The sausage was shipped by a small manufacturer in Texas to Mr. B. in New Iberia, La. It was delivered at 10 a. m. on March 21, 1942, packed in a shirt box lined with wax paper and wrapped with heavy brown paper. It was not refrigerated after receipt and not opened until 7 p. m. of the same day. At that time a portion, consisting of about 2 pounds, was given to a friend, Mr. H., and the remainder was taken to a nearby restaurant where a portion was fried and served to five people. The proprietor broiled a small portion for himself. A helper ate some pieces left over from that eaten by the party of five.

Mr. H. took his portion to the home of a relative, Mr. D., where

[1] From the Louisiana State Department of Health.
[2] Director, Division of Laboratories.
[3] Director, Division of Preventive Medicine.
[4] Formerly Director, Iberia Parish Health Unit, now on military leave.

some was fried and eaten by him and his wife. Mr. and Mrs. H. then went to their home in another city, leaving the balance of the sausage with the D. family who refrigerated it overnight and served it to their family of six on the next day, March 22, 1942.

Of the 15 who ate of the sausage, only 1, the restaurant proprietor, did not become ill. At the time of investigation, only 9 of the 14 were located and questioned (table 1). The remaining 5 known to have eaten of the sausage had left the city and were not traced.

These nine became ill in from 5 to 48 hours after eating the sausage, six of them in 10 hours or less. Three of the cases, members of the family group who ate of the sausage on Sunday, March 22, 1942, became ill 18, 27, and 48 hours afterward.

The onset was sudden, with nausea and vomiting, followed by diarrhea, chills and fever, and occasionally tenesmus. Two cases varied from this in that diarrhea only was present. Both of them had positive stools for *S. berta*. The diarrhea was relatively marked in all cases but none had blood in the stools. Fever was a common symptom, the temperature rising to 102° F. in some cases. Two of the cases, both young white males, were sufficiently ill to be hospitalized. The acute symptoms subsided in from 3 to 8 days, leaving the patients in a weakened condition. All cases recovered.

After a preliminary investigation of the outbreak, on March 24, by the local Parish Health Unit, it was felt that all of the individuals were suffering from food poisoning and that the sausage was the probable agent. Several pounds of the remaining sausage were collected and shipped to the State Central Laboratory for bacteriological examination, where it was received March 27, 1942.

A Gram negative, motile organism giving the following biochemical reactions was isolated from cultures made from various portions of the sausage:

Acid and gas from: Dextrose, mannitol, maltose, dulcitol, rhamnose, sorbitol, arabinose, xylose, trehalose.
No action from: Lactose, adonite, inositol, salicin.
Simmons citrate agar: Positive.
Phenol red tartrate agar: Positive.
Gelatin: No liquefaction.
No H_2S produced.
Indol not formed.

As soon as it became apparent in the laboratory that the contaminating organism might belong to the *Salmonella* group, it was recommended to the Health Unit director that he collect stool specimens on those affected.

Stools from five of the cases, including the two hospitalized, were collected on March 31, 1942, and sent to the central laboratory where they were received April 2, 1942. Following the isolation of

TABLE 1.—*Chart of findings and results of laboratory examination by cases*

Case	Color	Sex	Age	Date of onset	Incubation period	Duration of illness	Symptoms: Nausea	Symptoms: Vomiting	Symptoms: Diarrhea	Symptoms: Chills	Symptoms: Fever	Stool: Date collected	Stool: *S. berta*	Serum: Date collected	Serum: Agglutination *S. berta* (titer)	Remark
				1942	*Hours*	*Days*						*1942*		*1942*		
I. B	W	M	34	Mar. 22	10	4	+		+	+	+	Apr. 21	Positive	Apr. 15	Positive; 1:160	
S. B	W	M	26	do	10	7		+	+	+	+					
C. J	N	M	13	do	10	7	+		+		+	Apr. 16	Negative	do	Positive; 1:180	Relatively mild
V. D	W	F	21	do	9	3	+	+	+	+	+	do	Positive	do	Positive; 1:160	
R. D	W	M	10	do	8	8	+	+	+	+	+	Mar. 31	do			Hospitalized.
												Apr. 16	do			
L. D	W	M	18	do	5	8	+	+	+	+	+	Mar. 31	Negative			Do.
L. D	W	F	15	Mar. 24	48	4			+			do	do	Apr. 15	Negative	Relatively mild.
												Apr. 21	Positive			
Mrs. J. L. D	W	F	52	Mar. 23	27	6	+	+	+	+	+	Mar. 31	do			
												Apr. 16	do			
Mr. J. L. D	W	M	62	do	18	4			+			Mar. 31	Negative			Do.
												Apr. 16	Positive			

S. berta in two of these five specimens,[5] further stool specimens were requested on these five cases and on all of the others if possible. These specimens were collected on April 16 and 21 and received in the laboratory on April 20 and 27, respectively.

Stools from a total of eight of the individuals were submitted for bacteriological examination and an organism identical in character and giving the same biochemical reaction as that isolated from the sausage was recovered from the stools of six of the eight.

The organism gave positive agglutination reactions with enteritidis serum, but since its biochemical reactions were not identical with those of *Salmonella enteritidis*, cultures of the organism isolated from both sausage and stools were sent to Dr. R. P. Edwards, of the National Salmonella Center, Lexington, Ky., and were classified as *S. berta*.

To complete the investigation, samples of blood for agglutination tests were collected from as many patients as possible. Blood specimens from three out of four of these patients collected approximately one month after onset of the disease agglutinated *S. berta*.

In comparing the antigenic formula of *S. enteritidis* IX, XII: gm., with that of *S. berta* IX, XII: fgt., it can readily be seen why it agglutinated with *S. enteritidis* serum (*2*, *3*).

In reviewing the literature, it was found that this organism had previously been isolated by Hormaeche and Salsamendi (*1*) and Hormaeche and Peluffo (*4*) from mesenteric glands of normal pigs in Montevideo, Uruguay. After intensive studies of the organism they concluded that it could not be included in any of the known *Salmonella* types because of its antigenic formula.

Kauffman (*5*) studied the strain and accepted the formula proposed by Hormaeche as *S. berta*, IX, XII: fgt.

Hormaeche, Peluffo, and Salsamendi (*6*) also studied the pathogenicity of *S. berta* and found it to be pathogenic for the rabbit and rat. However, they state that "until now we have only found *S. berta* in a normal pig, we cannot then affirm the spontaneous pathogenic action of this type for the pig or man."

As the occurrence of *S. berta* in this country in animals or man had not previously been reported, an investigation of the source of the pork used in the sausage was conducted. The Federal Bureau of Animal Industry reported nothing to indicate that any of the hogs used were imported; but, on the contrary, that they were of domestic stock.

Since the recovery of *S. berta* from these cases, it has been found in New York City and Florida. A personal communication from the National Salmonella Center in New York State (*7*) describes a case of

[5] In the cases of L. D. (W. F., 15) and L. D. (W. M., 18) the specimens collected on March 31, 1942, were reported as negative for *S. berta*. It was noted at the time of receipt of the specimens in the laboratory that there was "excessive feces in bottle."

"chronic diarrhea with intermittent attacks for the past years with blood and mucous in the stool" in which *S. berta* was isolated from the stools. In another communication (*8*), Dr. Edwards states that he has typed four other cultures of *S. berta* received from the State of Florida, two from feces in enteric fevers, one from feces in gastroenteritis, and one from a stool culture of a normal human carrier.

SUMMARY

An outbreak of food poisoning due to *S. berta* in sausage is described.

The illness was characterized by nausea and vomiting, followed by diarrhea, chills and fever, and occasionally tenesmus.

S. berta was isolated from the sausage and from stool specimens submitted.

Blood specimens showed agglutinins for *S.berta.*

Evidence has been presented to show *S.berta* pathogenic for man.

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PROVISIONAL MORTALITY FROM SPECIFIC CAUSES IN 1944 AND PRECEDING YEARS

Annual mortality rates for specific causes for the 5 years 1940–44 are shown in table 1 for a group of 39 States and the District of Columbia.[1] These data are made available through a cooperative arrangement with the respective States which furnish provisional tabulations of current birth and death records to the Public Health Service. For several reasons the rates are provisional and will differ from final figures subsequently published by the Bureau of the Census. To keep the comparision of changes from year to year on the same basis, the rates for preceding years represent the same type of provisional data as are used for the 1944 figures. Populations are estimates as of July 1 as published by the Bureau of the Census; they

[1] Detailed tables showing rates for each State are available in multilithed form upon request. They are not printed here because of lack of space.

include members of the armed forces stationed in each State but exclude those outside of the country.

TABLE 1.—*Summary of mortality trends from certain causes in a group of 40 States*[1] *1940–44 (estimated population July 1, 1944, 110,964,645) (rates provisional for all years)*

Diseases (numbers in parentheses are from the International List of Causes of Death, 1938 revision)	1944	1943	1942	1941	1940
	Rate per 1,000 population				
Deaths, all causes	10.6	10.9	10.3	10.4	10.6
Births, exclusive of stillbirths	20.4	21.3	20.6	18.5	17.5
	Rate per 1,000 live births				
Infant mortality (live births, 1944, 2,264,148)	40	40	40	45	45
Maternal mortality	2.1	2.3	2.5	3.0	3.5
	Rate per 100,000 population				
Typhoid and paratyphoid fever (1, 2)	0.38	0.49	0.51	0.77	1.01
Dysentery (27)	1.20	1.25	1.28	1.93	1.90
Diarrhea and enteritis under 2 years (119)	7.29	6.89	6.40	7.38	6.99
Appendicitis (121)	5.52	5.76	6.28	8.15	10.01
Scarlet fever (8)	.32	.34	.33	.35	.51
Diphtheria (10)	.73	.77	.83	.89	1.00
Whooping cough (9)	1.29	2.40	1.77	2.61	1.97
Measles (35)	1.38	.93	.80	1.56	.47
Cerebrospinal (meningococcus) meningitis (6)	2.12	2.12	.64	.48	.44
Acute poliomyelitis and acute polioencephalitis (36)	1.06	.76	.38	.56	.70
Acute infectious encephalitis (lethargic) (17)	.44	.49	.43	.72	.52
Malaria (28)	.32	.34	.47	.63	.74
Pellagra (69)	.66	.87	1.00	1.17	1.28
Tuberculosis, all forms (13–22)	39.7	41.1	41.4	42.8	43.8
Syphilis (30)	10.3	11.0	11.2	12.9	13.9
Influenza (grippe) (33)	12.9	12.7	8.0	15.8	14.5
Pneumonia (107–109)	47.4	52.5	46.4	47.7	54.3
Cancer, all forms (45–55)	130.2	125.8	123.5	121.0	120.0
Diabetes mellitus (61)	27.1	28.0	25.8	25.8	26.8
Intracranial lesions of vascular origin (83)	94.2	95.9	90.9	87.4	90.4
Diseases of the heart (90–95)	320.0	323.8	298.0	291.4	293.9
Nephritis, all forms (130–132)	68.6	73.9	71.5	73.4	77.2
All accidents, including automobile accidents (169–195)	66.4	68.8	67.3	73.1	70.1
Automobile accidents (170a, b, c)	16.3	16.0	19.5	28.0	24.4

[1] Includes all States except Alabama, Arizona, Arkansas, California, Mississippi, New Hampshire, Oregon, Washington, and West Virginia.

The data in table 1 are crude rates which take no account of changes since 1940 in the age composition of the population. Such changes, however, have been large and of a character which affects the crude death rates considerably. Specifically, the withdrawal from the population of the United States, for foreign service in the armed forces, of several million men of the age groups which have the lowest death rates leaves in this country an abnormal population composed of a considerably higher percentage of old people than was true at the time of the 1940 census. Since withdrawals continued throughout 1944 with few soldiers returning to the United States, the effect on the crude mortality rates was cumulative; thus crude rates for 1944 are less comparable with those for 1940 than were rates for 1943 and 1942.

Table 2 shows for the more important causes death rates for 1943 and 1944 that have been adjusted [2] for this changing age distribution of the population. The crude death rates per 1,000 population from all causes for 1944 and 1943 were 10.6 and 10.9, respectively, as compared with 10.6 for 1940. When these rates are adjusted for changing age distribution they are 9.8, 10.4, and 10.6 for 1944, 1943, and 1940, respectively. The 1944 adjusted rate from all causes is only 93 percent of the crude rate and the 1943 rate is 95 percent of the crude rate.

TABLE 2.—*Crude and adjusted death rates for certain diseases, 1944 and prior years*

Diseases	Age adjusted (40 States)			All States	Crude (40 States)		Ratio of adjusted to crude rate	
	1944	1943	1940	1940	1944	1943	1944	1943
	Rate per 1,000 population							
All causes	9.8	10.4	10.6	10.8	10.6	10.9	0.928	0.954
	Rate per 100,000 population							
Cancer, all forms	121.0	120.1	119.9	120.1	130.2	125.8	.929	.955
Diabetes mellitus	25.1	26.7	26.8	26.6	27.1	28.0	.926	.953
Diseases of the heart	295.0	307.6	293.9	292.3	320.0	323.8	.922	.950
Intracranial lesions of vascular origin	86.5	90.9	90.4	90.9	94.2	95.9	.918	.948
Nephritis, all forms	63.3	70.3	77.2	81.4	68.6	73.9	.923	.951
Pneumonia	43.1	49.3	54.3	54.9	47.4	52.5	.909	.939
Tuberculosis, all forms	39.4	40.8	43.8	45.8	39.7	41.1	.992	.993
Accidents (other than automobile)	48.2	51.6	45.7	68.2	50.1	52.8	.962	.975

Rates for cancer, diabetes, heart disease, nephritis, and intracranial lesions of vascular origin all show approximately the same percentage reduction by reason of age adjustment; the 1943 adjusted rates are approximately 95 percent of the respective crude rates, and the 1944 adjusted rates are approximately 93 percent of the crude rates. Since these diseases all have a roughly similar age curve of mortality, with exceptionally high rates in the oldest ages, this rough similarity in the percentage reduction by reason of the adjustment

[2] The adjustment of the rate for age changes since 1940 is done as follows: Death rates for each specific age group in 1940 are multiplied by the 1944 estimated population for that age group to obtain an expected number of deaths at the 1940 age-specific rates. These expected deaths for specific ages are added to get a figure for all ages which is divided by the 1944 estimated population for all ages to obtain an expected death rate in 1944. This expected rate represents the crude death rate that would occur in 1944 if the age-specific death rates were identical with those in 1940. Any difference between this expected rate for all ages for 1944 and the actual rate for all ages in 1940, therefore, represents the result of changes in the age composition of the population since 1940. For example, if the actual 1940 rate for all ages is 95 percent of the expected rate for 1944, it means that the actual observed rate in 1944 can be corrected for age changes by multiplying by 0.95. This multiplier, which is called the "adjustment factor," is obtained as follows:

$$\text{Adjustment factor} = \frac{\text{Actual death rate in 1940 (all ages)}}{\text{Expected death rate in 1944 (all ages)}}$$

Thus if age changes will increase the 1944 crude rate for all ages by 5 percent without any change in the age-specific death rates, the actual crude rate for 1944 must be reduced by approximately that percentage to make it comparable with the 1940 rate. This process eliminates the change in the crude death rate that is due to age changes and indicates what the trend has been when the effects of age changes are eliminated.

Adjustments for 1943 are, of course, made by an identical method using population estimates for that year.

was to be expected. The cumulative effect as more young adult males were sent abroad is illustrated by the fact that adjustment for age makes a larger difference in 1944 than in 1943.

Age adjustment had considerable effect on the pneumonia rate, the adjusted rate in 1944 being only 91 percent of the crude rate. On the other hand, adjustment for age had little or no effect on the tuberculosis rate, the adjusted rates for 1944 and 1943 both being better than 99 percent of the crude rates. Accidents other than automobile are also not greatly affected by this process, the adjusted rates in 1944 and 1943 being 96 and 98 percent of the respective crude rates for those years.

DEATHS DURING WEEK ENDED SEPTEMBER 1, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 1, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,548	7,610
Average for 3 prior years	7,747	
Total deaths, first 35 weeks of year	316,984	320,009
Deaths under 1 year of age	638	615
Average for 3 prior years	620	
Deaths under 1 year of age, first 35 weeks of year	21,211	21,688
Data from industrial insurance companies:		
Policies in force	67,342,877	66,720,177
Number of death claims	14,013	12,009
Death claims per 1,000 policies in force, annual rate	10.9	9.4
Death claims per 1,000 policies, first 35 weeks of year, annual rate	10.4	10.2

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 8, 1945

Summary

For the second consecutive week a decrease was reported in the incidence of poliomyelitis for the country as a whole. Of a total of 891 cases reported for the current week, as compared with 917 last week, 1,498 for the corresponding week last year, and 758 for the 5-year (1940-44) median, 453, or 51 percent, occurred in the Middle Atlantic and East North Central areas. Of 24 States reporting 9 or more cases each, 11 reported an aggregate increase of 92 cases, while the other 13 States reported a decrease of 124 cases. States reporting the largest increases are Illinois (from 94 to 131) and Washington (22 to 33). The largest decreases were reported in New York (138 to 114), New Jersey (96 to 60), and Utah (34 to 23). Of the total of 7,047 cases reported to date this year, 4,615 occurred during the past 6 weeks (since July 28). For the corresponding periods last year the figures are, respectively, 10,972 and 7,912. In the 10-year period 1935–44, the peak of incidence of this disease, based on the date of reports, occurred 6 times by the end of the second week of September.

Of the total of 73 reported cases of meningococcus meningitis, as compared with 59 cases last week and 91 for the next earlier week, New York and Ohio reported 6 cases each, and Illinois, Texas, and California, 5 each. The total to date this year is 6,399, as compared with 13,481 for the same period last year and a 5-year median of 2,541.

The incidence to date of diphtheria, the dysenteries, tularemia, undulant fever, and whooping cough is above that for last year.

An aggregate of 8,120 deaths was reported for the week in 93 large cities in the United States, as compared with 8,549 for the preceding week, 7,673 for the corresponding week last year, and a 3-year (1942–44) average of 7,550. The total to date is 325,105, as compared with 327,682 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended September 8, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944	
NEW ENGLAND												
Maine	0	0	1	------	------	------	3	0	7	1	0	0
New Hampshire	0	0	0	------	------	------	0	0	0	0	0	0
Vermont	2	1	1	------	------	------	1	1	4	0	0	0
Massachusetts	3	2	2	------	------	------	28	13	34	0	3	2
Rhode Island	0	2	0	23	7	------	0	4	4	2	0	1
Connecticut	0	0	0	------	------	1	2	13	10	3	3	1
MIDDLE ATLANTIC												
New York	13	6	6	[1] 2	------	[1] 1	10	36	71	6	17	7
New Jersey	4	0	3	------	5	5	14	5	33	2	6	4
Pennsylvania	2	4	5	1	4	------	31	21	33	4	11	4
EAST NORTH CENTRAL												
Ohio	6	5	5	2	5	6	7	8	18	6	2	2
Indiana	5	11	4	2	------	1	6	1	5	3	1	1
Illinois	4	3	9	9	------	3	54	10	23	5	3	2
Michigan [2]	9	3	3	------	------	1	18	17	23	2	3	1
Wisconsin	2	0	0	9	6	13	20	27	54	2	2	1
WEST NORTH CENTRAL												
Minnesota	8	7	6	------	------	------	6	1	9	1	2	0
Iowa	0	1	3	------	------	------	0	2	3	0	1	1
Missouri	2	2	4	------	------	1	6	6	6	1	1	1
North Dakota	5	0	1	------	------	1	0	0	0	0	0	0
South Dakota	6	3	3	------	------	------	2	2	2	1	0	0
Nebraska	1	0	1	5	5	1	3	3	3	0	1	0
Kansas	5	4	3	------	------	2	6	4	3	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	1	0	1	0	1	0
Maryland [2]	12	1	1	1	1	1	7	6	9	1	1	2
District of Columbia	0	0	1	------	------	------	0	2	4	0	1	1
Virginia	11	13	12	119	75	76	3	10	10	1	2	2
West Virginia	9	2	7	------	3	3	0	3	3	0	2	2
North Carolina	41	13	34	------	------	------	1	5	10	2	2	1
South Carolina	33	12	15	176	110	120	5	11	11	1	2	1
Georgia	25	8	19	3	13	13	1	2	2	1	5	1
Florida	5	5	5	------	------	1	1	12	4	1	1	0
EAST SOUTH CENTRAL												
Kentucky	35	5	5	------	------	------	9	2	6	3	3	1
Tennessee	14	4	12	7	1	3	0	4	17	1	1	2
Alabama	14	30	30	14	1	3	0	0	3	3	2	1
Mississippi [2]	27	13	10	------	------	------	------	------	------	2	3	2
WEST SOUTH CENTRAL												
Arkansas	10	9	9	4	18	4	5	0	5	0	1	0
Louisiana	8	9	5	139	2	2	2	0	2	1	0	0
Oklahoma	6	7	6	7	1	15	3	1	2	1	3	0
Texas	50	32	32	433	356	273	38	25	25	5	2	1
MOUNTAIN												
Montana	0	0	0	5	10	1	0	0	2	2	0	0
Idaho	2	0	0	4	------	------	22	2	0	0	0	0
Wyoming	0	0	0	------	------	------	2	4	4	0	0	0
Colorado	0	6	8	3	1	4	3	5	5	2	4	1
New Mexico	2	4	2	------	1	------	2	5	5	0	0	0
Arizona	2	1	1	11	17	21	2	2	2	0	0	0
Utah [2]	0	0	0	------	------	2	37	2	6	1	0	0
Nevada	0	1	0	------	------	------	0	0	0	0	1	0
PACIFIC												
Washington	6	2	2	------	------	------	27	11	8	0	3	1
Oregon	2	1	1	------	7	2	18	12	12	0	2	1
California	19	7	8	10	5	9	59	92	55	5	12	1
Total	410	239	314	989	654	654	465	392	576	73	110	46
36 weeks	9,304	7,451	8,192	73,299	340,323	170,447	103,024	592,714	540,027	[3] 6,401	13,481	2,541

[1] New York City only.

[2] Period ended earlier than Saturday.

[3] Correction: Massachusetts, week ended Sept. 1, meningococcus meningitis 2 cases (instead of 0).

Telegraphic morbidity reports from State health officers for the week ended September 8, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944		Sept. 8, 1945	Sept. 9, 1944	
NEW ENGLAND												
Maine	10	0	2	23	9	5	0	0	0	0	0	1
New Hampshire	1	6	0	5	0	2	0	0	0	0	0	0
Vermont	8	2	2	0	3	2	0	0	0	0	4	2
Massachusetts	30	42	18	41	48	48	0	0	0	0	4	2
Rhode Island	1	1	1	0	2	2	0	0	0	0	0	1
Connecticut	9	13	6	4	5	8	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	114	581	68	92	48	56	0	0	0	8	12	12
New Jersey	60	50	22	10	9	26	0	0	0	2	2	3
Pennsylvania	62	130	11	38	48	47	0	0	0	12	12	15
EAST NORTH CENTRAL												
Ohio	33	92	33	63	61	52	0	0	0	7	8	8
Indiana	28	23	16	12	19	16	0	0	0	2	2	5
Illinois	131	45	44	50	44	44	1	0	0	4	5	9
Michigan [2]	11	75	34	36	33	32	0	0	0	1	3	6
Wisconsin	19	20	14	47	24	38	1	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota	17	48	14	11	19	18	0	0	0	0	1	0
Iowa	9	25	23	19	22	15	0	1	0	2	0	1
Missouri	31	14	14	18	8	13	0	0	0	3	3	8
North Dakota	5	7	1	6	2	2	0	0	0	0	0	0
South Dakota	1	0	1	0	1	4	0	1	0	0	0	0
Nebraska	7	11	11	10	6	4	0	0	0	0	0	0
Kansas	13	7	7	18	18	21	0	0	0	2	3	2
SOUTH ATLANTIC												
Delaware	3	12	0	2	1	1	0	0	0	1	0	2
Maryland [2]	[5] 5	32	2	15	19	11	0	0	0	5	2	2
District of Columbia	4	17	2	3	9	3	0	0	0	0	0	0
Virginia	30	67	15	68	23	22	0	0	0	10	6	11
West Virginia	9	24	3	53	45	32	0	0	0	1	5	8
North Carolina	11	26	7	30	36	38	0	0	0	3	4	4
South Carolina	6	4	3	9	5	7	0	0	0	7	2	8
Georgia	3	1	1	8	6	16	0	0	0	10	5	5
Florida	0	4	0	3	8	2	0	0	0	9	2	1
EAST SOUTH CENTRAL												
Kentucky	4	33	17	14	14	20	0	0	0	10	5	11
Tennessee	30	10	10	30	13	25	0	1	0	36	1	18
Alabama	4	5	2	19	21	16	0	0	0	2	4	4
Mississippi [2]	1	9	4	9	12	9	0	0	0	4	8	10
WEST SOUTH CENTRAL												
Arkansas	5	0	1	6	5	3	0	0	0	7	9	9
Louisiana	7	5	3	13	1	3	0	0	0	2	15	15
Oklahoma	10	1	1	11	6	11	0	0	0	6	1	12
Texas	30	11	6	46	22	20	0	0	0	10	24	24
MOUNTAIN												
Montana	7	6	1	2	4	6	0	0	0	2	0	0
Idaho	1	0	0	3	4	3	0	0	0	4	3	1
Wyoming	2	0	0	3	0	1	0	0	0	0	0	0
Colorado	23	6	3	6	17	14	0	0	0	0	4	3
New Mexico	1	3	1	3	4	1	0	0	0	3	0	2
Arizona	1	0	0	0	1	1	0	0	0	1	0	3
Utah [2]	28	0	0	6	2	3	0	0	0	1	0	0
Nevada	1	0	0	0	1	0	0	0	0	0	0	0
PACIFIC												
Washington	33	7	7	20	18	11	0	1	0	1	0	1
Oregon	7	11	6	7	8	6	0	0	0	2	1	1
California	30	12	12	87	61	42	0	0	0	5	5	4
Total	891	1,498	758	979	795	795	2	4	2	185	166	202
36 weeks	7,047	10,972	4,611	137,174	149,688	100,121	275	311	625	3,296	3,762	4,700

[2] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately as follows: Illinois, 1; Virginia, 3; South Carolina, 1; Georgia, 2; Florida, 1; Kentucky, 1; Louisiana, 1; Texas, 2; Montana, 1; Utah, 1; California, 1.
[5] 1 June case included, delayed report.

Telegraphic morbidity reports from State health officers for the week ended September 8, 1945, and comparison with corresponding week of 1944 and 5-year median.—Con.

Division and State	Whooping cough: Week ended— Sept. 8, 1945	Whooping cough: Week ended— Sept. 9, 1944	Whooping cough: Median 1940-44	Week ended September 8, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	20	10	16	0	0	0	0	0	0	0	2
New Hampshire	0	0	0	0	0	0	0	0	0	0	0
Vermont	24	29	16	0	0	0	0	0	0	0	1
Massachusetts	0	55	72	0	3	0	0	0	0	0	0
Rhode Island	20	7	7	0	0	0	0	0	0	0	0
Connecticut	43	53	44	0	0	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	296	121	266	4	17	0	1	1	0	0	0
New Jersey	144	44	115	0	0	5	0	0	0	0	4
Pennsylvania	122	48	185	0	0	0	0	1	0	0	3
EAST NORTH CENTRAL											
Ohio	221	116	160	1	0	0	1	0	0	0	1
Indiana	25	24	26	2	0	3	1	0	0	0	4
Illinois	133	109	176	11	3	0	3	0	1	0	5
Michigan [2]	93	47	190	2	4	0	0	0	0	0	6
Wisconsin	63	106	184	0	0	0	0	0	0	0	4
WEST NORTH CENTRAL											
Minnesota	28	43	48	1	0	0	0	0	0	0	1
Iowa	6	6	25	0	0	0	0	0	0	0	0
Missouri	12	29	20	0	0	1	0	0	0	0	3
North Dakota	2	6	6	0	0	0	0	0	0	0	0
South Dakota	9	22	4	0	0	0	0	0	0	0	1
Nebraska	0	12	12	0	0	0	0	0	0	0	0
Kansas	28	32	32	0	0	0	1	0	0	0	1
SOUTH ATLANTIC											
Delaware	0	1	1	0	0	0	0	0	0	0	0
Maryland [2]	32	78	61	0	0	2	0	0	0	0	0
District of Columbia	7	4	9	0	0	0	0	0	0	0	0
Virginia	51	41	71	0	0	505	0	6	4	0	3
West Virginia	10	13	13	0	0	0	0	0	0	0	0
North Carolina	43	94	80	0	1	0	0	0	0	7	0
South Carolina	73	67	63	3	82	0	0	1	0	8	0
Georgia	32	9	20	1	6	1	0	3	0	33	1
Florida	5	1	2	1	3	0	0	0	0	3	0
EAST SOUTH CENTRAL											
Kentucky	44	25	40	0	0	2	0	0	0	0	0
Tennessee	22	20	34	0	0	9	0	1	0	2	0
Alabama	3	8	8	0	0	0	0	0	0	24	0
Mississippi [2]	------	------	--------	0	0	0	0	0	1	10	7
WEST SOUTH CENTRAL											
Arkansas	8	17	14	9	4	0	0	2	3	0	1
Louisiana	8	4	4	0	2	0	0	0	0	12	0
Oklahoma	13	2	8	0	8	0	1	2	0	0	2
Texas	134	126	127	5	658	28	0	0	0	33	17
MOUNTAIN											
Montana	0	73	8	0	0	0	0	0	1	0	0
Idaho	4	0	0	0	0	0	0	1	0	0	0
Wyoming	1	12	6	0	0	0	0	0	0	0	1
Colorado	57	30	30	0	0	0	0	0	0	0	1
New Mexico	1	11	11	0	6	0	0	0	1	0	1
Arizona	4	3	3	0	0	15	0	0	0	0	2
Utah [2]	11	15	24	0	0	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	26	16	25	0	0	0	0	0	0	0	0
Oregon	8	17	17	1	0	0	0	0	0	0	2
California	105	47	114	1	0	0	10	0	0	0	2
Total	1,991	1,653	2,542	42	797	571	18	18	11	132	77
Same week, 1944	1,653	------	--------	30	461	386	17	18	11	171	63
Average, 1942-44	2,364	------	--------	35	399	328	20	[6] 12	13	[6] 134	------
36 weeks: 1945	90,860	------	--------	1,316	18,020	7,554	355	404	550	3,182	3,330
1943	68,301	------	--------	1,209	15,621	6,026	459	407	408	3,262	2,522
Average, 1942-44	113,071	------	[6] 130,991	1,164	11,171	5,518	446	[6] 406	576	[6] 2,232	------

[2] Period ended earlier than Saturday.

[6] 5-year median, 1940-44.

Anthrax: Georgia, 1 case.

NOTIFIABLE DISEASES, SECOND QUARTER 1945 [1]

The figures in the following table are the totals of the monthly morbidity reports received from the State health authorities for April, May, and June 1945. These reports are preliminary and the figures are therefore more or less incomplete. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but owing to population shifts and the presence of large military populations in certain States, the figures for some States are not comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State. The lists of diseases required to be reported are not the same for each State. Only 11 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported, and the figures are included although manifestly incomplete. There are also variations among the States in the degree of completeness of reporting of cases of the reportable diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating a trend by providing a comparison with similar preliminary figures for prior years. To some extent they also give a picture of the geographic prevalence of certain diseases, as the States are arranged by geographic location.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for April, May, and June 1945

Division and State	Anthrax	Chickenpox	Conjunctivitis [2]	*Diphtheria	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria [3]	*Measles	*Meningitis, meningococcus	Mumps	Ophthalmia neonatorum	Pellagra	Pneumonia all forms
NEW ENGLAND																		
Maine	----	702	----	3	----	----	----	----	81	----	19	5	24	6	513	----	----	196
New Hampshire	----	159	----	----	----	----	----	----	38	----	1	----	207	5	123	----	----	14
Vermont	----	768	----	7	----	----	----	----	842	----	----	2	248	1	1,284	----	----	2
Massachusetts	----	3,367	79	52	3	20	----	2	501	----	----	362	3,137	58	6,330	47	----	723
Rhode Island	----	352	----	2	----	4	----	2	4	----	485	17	141	11	391	----	----	80
Connecticut	----	2,266	14	16	1	----	----	1	219	1	35	23	1,396	23	1,418	----	----	710
MIDDLE ATLANTIC																		
New York	1	8,499	----	125	54	107	----	7	----	----	[4] 21	372	1,665	244	[4] 2,171	20	----	4,188
New Jersey	----	7,129	----	34	7	2	----	1	1,223	----	41	344	744	70	3,307	4	----	708
Pennsylvania	5	6,454	----	96	3	----	----	2	----	----	15	----	5,874	142	5,293	4	----	889
EAST NORTH CENTRAL																		
Ohio	----	4,143	----	75	3	3	1	4	633	----	62	14	838	111	1,856	114	----	696
Indiana	----	651	1	70	2	----	6	----	102	1	72	160	458	37	814	----	----	65
Illinois	----	3,293	----	48	21	17	----	17	433	----	42	1	3,447	185	2,821	125	----	1,489
Michigan	----	4,706	103	124	14	10	----	----	615	1	21	171	2,992	74	2,898	10	----	585
Wisconsin	----	7,618	----	20	1	----	----	3	----	----	316	25	1,015	36	6,191	----	----	186

WEST NORTH CENTRAL																		
Minnesota		2,463	1	58	[5] 29	5	5				22	20	163	27		1		59
Iowa		711		39					12			240	683	31	1,181			537
Missouri		444		48			3	1	31		37	136	329	77	745			321
North Dakota		228	2	22			1	3			62	1	44	3				271
South Dakota		280		18				1					230	6	71			39
Nebraska		462		26				1			35	1	512	10	306			79
Kansas		983	31	68	2	1	1	3	279		17	522	560	25	2,229			176
SOUTH ATLANTIC																		
Delaware		46		10								19	45	5	137			5
Maryland		966	8	115	3	3	1		269		11	192	355	38	932	3		396
District of Columbia		354		7		3					3	71	73	17	120			158
Virginia		1,122		53	3		767	1			1,142	284	556	67	444		1	434
West Virginia		302		26	3	1		2			122	58	355	20	108			24
North Carolina				76	2	5		4				70	583	43				
South Carolina		850		74	47	393			264	268	2,028	2,736	329	22	1,363	7	220	994
Georgia		373	4	37	7	54	17			962	269	264	189	23	506		9	125
Florida		448	15	29	18	7	4		64	933	38	207	184	45	408	5	4	301
EAST SOUTH CENTRAL																		
Kentucky		276		27	1			1			9	342	370	37	401		1	248
Tennessee		354		30	6		14	5	44		236	49	702	69	723	3	6	434
Alabama		389		74	13			2	257		232	775	138	60	473		9	615
Mississippi		2,175		75	316	3,200				1,169	5,886	5,392	5,855	41	2,960	17	612	2,729
WEST SOUTH CENTRAL																		
Arkansas		308		26	10	33		1	361	7	263	574	515	36	751		6	621
Louisiana		129		51	43	15		1	60	96	97	478	627	31	217	12	1	746
Oklahoma		134		46	2	7		1			636	395	466	22	241		2	301
Texas		4,904		374	144	4,731	679	7			7,377	2,366	5,365	117	4,210	19	199	2,319
MOUNTAIN																		
Montana		467	77	11	1			2	87		96		131	6	470			61
Idaho		251	14	4	2	2			55		9		170	4	163			8
Wyoming		148	19	2	1				18			1	101	2	81			30
Colorado		981		74		3			13		225	[7] 376	252	7	1,121			257
New Mexico		161	10	35	4	6	5		11		17	32	138	4	99		3	188
Arizona		454		26	6	2	256	2	140		662	47	192	4	184		2	357
Utah		1,552		1				1	257		112	42	2,890	6	1,574			53
Nevada		45	9		2		6				257		46		98			15
PACIFIC																		
Washington		2,722	23	85	1	2	131	4	427		33	2	2,722	35	2,440			431
Oregon		716		48			8	2			94	6	935	17	465			153
California		18,591	6	277	34	56		10	6,283		181	623	18,196	204	15,703			867
Total	6	94,986	416	2,644	809	8,692	1,905	94	13,623	3,438	21,338	17,817	67,187	2,164	76,337	391	1,075	[6] 24,883
Second quarter, 1944	10	108,042	459	2,440	697	9,676	1,726	155	21,103	4,121	23,340	14,540	289,419	4,706	73,375	480	1,458	29,787
Median, 1940-44	18	96,427		2,522	796	7,633	1,045	155	76,053	4,769	24,028	15,816	289,419	1,076	77,268	437	1,971	31,430
Hawaii Territory		586	8	6	11	67			73	53	3,635	70	919	9	170			35
Panama Canal Zone [8]		48		15	11	10						219	15	1	10			[6] 84

See footnotes at end of table.

Consolidated monthly State morbidity reports for April, May, and June 1945—Continued

Division and State	*Poliomyelitis	Rabies in man	Rheumatic fever	Rocky Mountain spotted fever	*Scarlet fever	Septic sore throat	*Smallpox	Tetanus	Trachoma	Trichinosis	*Tuberculosis, all forms	Tuberculosis, respiratory	Tularemia	*Typhoid and paratyphoid fever	Paratyphoid fever	Typhus fever, endemic	*Undulant fever	Vincent's infection	*Whooping cough
NEW ENGLAND																			
Maine	1				584	3		1		3	138	123	1	2			11	2	608
New Hampshire	1				323	16					36						3	3	85
Vermont	2				162						12			1			22	8	283
Massachusetts	5				3,897	49		2		7	767	726		31	27		10		1,801
Rhode Island	1		76		289	5					243	234		3	1		4	1	238
Connecticut	7				722	149		2		4	388	372		5			30		618
MIDDLE ATLANTIC																			
New York	93			7	[10] 7,714			4		4	3,508	3,291		46	15	3	71		2,829
New Jersey	17			8	1,464	27		4		10	922			10	2		25		1,677
Pennsylvania	13		324	4	5,925			1		1	1,107			56			40		2,446
EAST NORTH CENTRAL																			
Ohio	27	1	1		3,964	8	5	4	6	2	1,514	1,457	1	35	3	2	25	3	1,858
Indiana	13		2	8	1,122	11	18	4	4		741	711	1	23			11	40	218
Illinois	14	3	79	6	3,124	84	2	2	14		1,378	1,219	10	42	15	1	103	27	637
Michigan	8		93		3,130	147	2	10	1	1	1,505			26	10		98		795
Wisconsin	4				2,380	81	3				682		3	1			71		585
WEST NORTH CENTRAL																			
Minnesota	6		8		1,027	76	1				[4] 368			3			92	19	114
Iowa	3		3	2	504	3	6				244	244	1				27		34
Missouri	4		33		710		3		87		542		5	10			22		247
North Dakota	1		11		272	6	5	1	4		68	64		8			2	10	28
South Dakota					174	3	1		10		135			1			16		27
Nebraska	2				718		1				60						1		41
Kansas				1	806	1	6	2			181	165	3	6			48	18	353
SOUTH ATLANTIC																			
Delaware	1			1	64			1			52	52		2					14
Maryland	5		50	26	1,527	55		2		2	1,038	1,007		9	2		7	8	882
District of Columbia	4			1	345						444	390		7	1				121
Virginia	16			15	893	554		4			948	948	11	33	3	2	8		884
West Virginia	7			7	527	2					389		1	16		1	6		227
North Carolina	14	1		11	707	13					1,019	985	4	25	1	23	3		2,241
South Carolina	42		106	3	102		1	1			240		2	30	7	32	8		948
Georgia	18	2	9	5	281	58	4	7			396	396	17	67	12	140	58	28	244
Florida	21				69	7		10			283	195		46	13	106	6	35	139
EAST SOUTH CENTRAL																			
Kentucky	7	1		3	505	3					564	548	3	47	1	1	7		489
Tennessee	20			6	421	30	2	8	1		1,114		12	52	2	4	5	34	327
Alabama	51				185			10	1		677		2	51	3	97	29		393
Mississippi	7				126				14		404	391	14	26		31	17		2,554

WEST SOUTH CENTRAL																			
Arkansas	5				102	169	4	1	76		294	282	36	42	1	3	11		151
Louisiana	8		104		154	115	6	14			720	691	4	41	3	63	25		75
Oklahoma	9			2	246	48	4	1	24		616		7	9		1	10	2	212
Texas	266				930	457	6		34		1,630		4	130	12	427	213		3,678
MOUNTAIN																			
Montana	1		6	2	193	42		1	14		95	34	3	11	4		2	12	67
Idaho				1	232	15	1		1		28		1	10			8	2	47
Wyoming				11	158	21	2				6		3	2				1	35
Colorado	3		78	10	569	87	2				292		1	5			23	50	415
New Mexico					185	2	2		6		[5] 678	[5] 656		12			1		115
Arizona			5		402		1		44		355			16			3		316
Utah	10		72	2	236		3				54	51	16	4			48		458
Nevada				4	13	10	1		4		47			1			2	9	5
PACIFIC																			
Washington	11		78		916	80	2				735		1	9			6	103	267
Oregon	2			3	322	10	2				258			8			43		261
California	57	1	308		4,678		5	16	7	5	3,186	3,001		28	5	3	78		5,863
Total	807	9	1,455	149	54,099	2,447	101	113	352	39	31,101	18,233	167	1,048	143	940	1,359	415	36,960
Second quarter, 1944	628	10	917	162	65,856	1,961	100	89	845	94	35,661	19,087	159	1,149	140	823	1,108	642	27,806
Median, 1940–44	416	10		191	43,121	2,886	262	102	845	95	30,289	17,995	241	1,317		464	958	484	51,886
Hawaii Territory	1				40	2		6	1		281	243		11	7	26	3		4
Panama Canal Zone [8]											[9] 26	[9] 26		8	4				[9] 9

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States; paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table. Conjunctivitis was dropped from the list of reportable diseases in North Carolina on Jan. 1, 1945.

[1] For reports for first quarter of 1945 see page 622 of the PUBLIC HEALTH REPORTS of June 1, 1945.
[2] Includes cases of kerato and suppurative conjunctivitis and of pink eye.
[3] In some States practically all in the military.
[4] New York City only.
[5] Includes nonresidents.
[6] Includes 508 cases delayed reports for 26 weeks.
[7] Exclusive of prisoners of war.
[8] Includes the cities of Colon and Panama.
[9] In the Canal Zone only.
[10] Includes septic sore throat.

The following list includes certain rare conditions, diseases of restricted geographical distribution, and those reportable in or reported by only a few States:

Actinomycosis: Michigan 2, Minnesota 1.
Botulism: Illinois 1, Arizona 4, California 6.
Coccidioidomycosis: Arizona 2, California 11.
Colorado tick fever: Wyoming 2, Colorado 31.
Dengue: South Carolina 3, Texas 12, California 1, Hawaii Territory 11.
Dermatitis: New Hampshire 8.
Diarrhea: New Jersey 2, Ohio 81 (diarrhea and enteritis), Indiana 1, Michigan 8, Maryland 14, South Carolina 4,072, Florida 10, New Mexico 32, Utah 6, California 5.
Dog bite: Illinois 3,701, Michigan 2,986, Arkansas 197
Food poisoning: Indiana 3, Illinois 102, Minnesota 33, Louisiana 5, New Mexico 1, Nevada 1, Washington 5, California 188.
Granuloma (unspecified): Ohio 13.
Granuloma inguinale: Missouri 4, Florida 64, Tennessee 16, Mississippi 142, Louisiana 45.
Impetigo contagiosa: Indiana 10, Illinois 20, Michigan 188, Iowa 1, Missouri 2, North Dakota 1, Kansas 6, Maryland 2, Montana 4, Wyoming 3, Colorado 1, Nevada 30, Washington 77, Hawaii Territory 34.
Jaundice (including hepatitis and Weil's disease): Massachusetts 1, Indiana 8, Illinois 135, Michigan 47, Minnesota 2, Iowa 3, Kansas 3, Maryland 5, South Carolina 8, Florida 9, Louisiana 1, Montana 1, Idaho 11, Washington 36, Oregon 6, California 68, Hawaii Territory 47.
Leprosy: Connecticut 1, Illinois 1, Louisiana 1, Texas 4, Washington 1, California 6, Hawaii Territory 4.
Lymphocytic choriomeningitis: Tennessee 12, Utah 1.
Lymphogranuloma venereum: Missouri 4, Florida 39, Tennessee 22, Louisiana 35, Utah 2.
Plague (human): Hawaii Territory 1 (proved fatal).
Psittacosis: New York 2, Pennsylvania 3.
Puerperal septicemia: Tennessee 1, Mississippi 43, Louisiana 6, Nevada 1.
Rabies in animals: New York 139, Ohio 269, Illinois 142, Michigan 12, Iowa 14, Missouri 21, Kansas 2, Maryland 12, District of Columbia 41, South Carolina 44, Florida 2, Alabama 208, Arkansas 52, Louisiana 20, Texas 185, New Mexico 2, Utah 14, California 264.
Rat bite fever: Louisiana 1.
Relapsing fever: Texas 1.
Ringworm: Pennsylvania 208, Michigan 437, Minnesota 339, Iowa 1, Missouri 104, Idaho 1, Nevada 5, Washington 151.
Scabies: Pennsylvania 29, Michigan 201, Missouri 1, North Dakota 5, South Dakota 3, Kansas 16, Delaware 1, Montana 9, Idaho 14, Wyoming 4, Nevada 30.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 1, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	1		0	0	0	2	1	1	0	0	
New Hampshire:												
Concord	0	0		0	0	0	3	0	1	0	0	[illegible]
Vermont:												
Barre	0	0		0	0	0	0	0	0	0	0	[illegible]
Massachusetts:												
Boston	1	0		0	6	2	5	21	12	0	0	3[illegible]
Fall River	0	0		0	1	0	0	0	2	0	0	[illegible]
Springfield	0	0		0	0	0	0	0	0	0	1	[illegible]
Worcester	0	0		0	2	0	5	0	0	0	0	[illegible]
Rhode Island:												
Providence	0	1		0	0	0	0	0	0	0	1	1[illegible]
Connecticut:												
Bridgeport	0	0		0	0	0	1	1	0	0	0	[illegible]
Hartford	0	0		0	0	0	1	0	2	0	0	[illegible]
New Haven	0	1		0	0	1	0	1	0	0	0	1[illegible]
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0		0	1	0	3	6	3	0	0	
New York	8	1	2	0	12	1	44	53	13	0	4	13[illegible]
Rochester	0	0		0	2	0	1	18	3	0	0	[illegible]
Syracuse	0	0		0	0	1	2	0	3	0	0	2[illegible]
New Jersey:												
Camden	0	0	1	1	0	1	1	1	3	0	0	[illegible]
Newark	0	0	1	0	2	0	2	5	2	0	2	1[illegible]
Trenton	0	0		0	0	0	0	[1] 6	0	0	0	[illegible]
Pennsylvania:												
Philadelphia	1	0	3	0	16	9	9	17	8	0	3	5[illegible]
Pittsburgh	0	0	1	1	0	2	7	6	2	0	0	1[illegible]
Reading	0	0		0	0	0	0	0	0	0	0	[illegible]
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	1	0	0	3	13	4	2	0	0	[illegible]
Cleveland	0	0		1	3	0	1	13	7	0	0	6[illegible]
Columbus	1	0		0	0	0	1	0	2	0	0	[illegible]
Indiana:												
Fort Wayne	0	0		0	2	0	1	1	0	0	0	[illegible]
Indianapolis	3	0		0	1	0	4	4	1	0	1	[illegible]
South Bend	0	0		0	0	0	0	0	0	0	0	[illegible]
Terre Haute	0	0		0	0	0	0	0	0	0	0	[illegible]
Illinois:												
Chicago	0	0		1	31	4	20	26	21	0	1	5[illegible]
Springfield	0	0		0	0	0	1	0	0	0	0	[illegible]
Michigan:												
Detroit	5	0		0	10	1	2	6	5	0	0	6[illegible]
Flint	0	0		0	5	0	2	2	0	0	0	[illegible]
Grand Rapids	0	0		0	0	0	0	0	0	0	1	[illegible]
Wisconsin:												
Kenosha	0	0		0	0	0	0	0	1	0	0	[illegible]
Milwaukee	0	0		0	2	0	5	9	6	0	0	[illegible]
Racine	0	0		0	0	0	0	0	1	0	0	[illegible]
Superior	0	0		0	0	0	0	0	1	0	0	[illegible]
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	2		0	0	0	1	0	2	0	0	[illegible]
Minneapolis	1	0		0	1	0	1	3	5	0	0	
Missouri:												
Kansas City	0	0		0	1	0	3	1	4	0	0	[illegible]
St. Joseph	0	0		0	0	0	0	1	0	0	0	[illegible]
St. Louis	0	0	2	0	1	0	6	14	8	0	1	1[illegible]

See footnotes at end of table.

City reports for week ended July 28, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	0	0	1	6	0	0	0	
Kansas:												
Topeka	0	0	------	0	0	0	1	0	4	0	0	0
Wichita	0	1	------	0	0	0	0	1	0	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	3	0	0	0	0	1
Maryland:												
Baltimore	6	0	------	0	2	0	5	1	2	0	1	42
Cumberland	0	0	------	0	0	0	0	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	0	6	8	0	0	0	8
Virginia:												
Lynchburg	0	0	------	0	1	0	1	0	1	0	0	3
Richmond	0	0	------	0	0	0	0	9	2	0	0	0
Roanoke	0	0	------	0	0	0	1	0	0	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	2	0	0	0
Wheeling	0	0	------	0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	0	1	0	0	0	3
Wilmington	0	0	------	0	2	0	0	0	0	0	0	4
Winston-Salem	0	0	------	0	0	0	0	1	1	0	0	3
South Carolina:												
Charleston	0	0	2	0	0	0	1	0	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	1	0	0	0	0	0
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	1	3	0	0	0	0
Florida:												
Tampa	3	0	------	0	0	0	1	0	1	0	0	1
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	4	0	1	3	3	0	0	7
Nashville	0	0	------	0	0	0	1	2	2	0	0	8
Alabama:												
Birmingham	0	0	2	0	0	0	2	2	1	0	1	0
Mobile	1	0	------	0	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	0	0	0	0	0	0	0	
Louisiana:												
New Orleans	0	0	5	3	1	0	5	9	1	0	1	
Shreveport	2	0	------	0	0	0	2	3	0	0	1	
Texas:												
Dallas	1	0	------	0	0	0	1	1	3	0	0	1
Galveston	1	0	------	0	0	0	1	0	0	0	0	0
Houston	3	0	------	0	0	0	3	9	1	0	0	1
San Antonio	0	0	------	0	0	2	2	3	0	0	0	2
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	0	1	0	1	0
Great Falls	0	0	------	0	0	0	1	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	1	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	1	0	2	1	8	6	2	0	0	12
Pueblo	0	0	------	0	1	0	0	0	0	0	0	5
Utah:												
Salt Lake City	0	0	------	0	6		3	12	0	0	0	11

City reports for week ended July 28, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0		0	5	1	4	2	2	0	0	14
Spokane	2	0		0	1	0	2	1	4	0	2	1
Tacoma	0	0		0	10	0	0	0	0	0	0	0
California:												
Los Angeles	5	0	5	0	11	3	2	8	12	0	2	23
Sacramento	0	0		0	0	0	1	0	5	0	0	7
San Francisco	1	0	1	1	23	0	6	2	8	0	0	4
Total	46	7	27	8	168	32	215	[1] 313	181	0	24	725
Corresponding week, 1944	43		19	7	99		184		191	0	36	478
Average, 1940–44	43		27	[2] 8	[3] 173		[2] 215		201	0	38	942

[1] Exclusive of 2 cases for week ended August 18, delayed report, Trenton, New Jersey.
[2] 3-year average 1940–42. [3] 5-year median 1940–44.

Dysentery, amebic.—Cases: New York 6; Detroit 1.
Dysentery, bacillary.—Cases: Providence 3; Buffalo 1; New York 6; Chicago 1; Detroit 2. St. Louis 2 Charleston, S. C. 8; Nashville 1; Los Angeles 4.
Dysentery, unspecified.—Cases: San Antonio 4.
Rocky Mountain spotted fever.—Cases: Philadelphia 1.
Typhus fever, endemic.—Cases: Wilmington, N. C. 1; Charleston, S. C. 8; Atlanta 4; Savannah 7 Tampa 1; Birmingham 4; Little Rock 1; New Orleans 3; Houston 3; San Antonio 4.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,086,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.6	7.8	0.0	0.0	24	7.8	44.4	62.7	47	0.0	5.2	188
Middle Atlantic	4.2	0.5	3.7	0.9	15	6.5	31.9	51.8	17	0.0	4.2	113
East North Central	5.5	0.0	0.6	1.2	33	4.9	30.4	39.5	29	0.0	1.8	137
West North Central	2.3	6.8	4.5	0.0	7	0.0	29.3	58.6	52	0.0	2.3	43
South Atlantic	14.7	0.0	3.3	0.0	8	0.0	34.3	37.6	16	0.0	1.6	106
East South Central	5.9	0.0	11.8	0.0	24	0.0	23.6	41.3	35	0.0	5.9	89
West South Central	23.0	0.0	14.3	8.6	3	5.7	40.2	71.7	14	0.0	5.7	20
Mountain	0.0	0.0	7.9	0.0	71	7.9	95.3	143.0	32	0.0	7.9	222
Pacific	12.7	0.0	9.5	1.6	79	6.3	23.7	20.6	49	0.0	6.3	77
Total	7.1	1.1	4.1	1.2	26	4.9	33.0	48.0	28	0.0	3.7	111

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended August 11, 1945.—During the 4 weeks ended August 11, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	2	Ophthalmia neonatorum	3
Chickenpox	24	Poliomyelitis	1
Diphtheria	58	Syphilis	327
Dysentery, unspecified	30	Tetanus	13
Filariasis	1	Tetanus, infantile	1
Gonorrhea	271	Tuberculosis (all forms)	486
Influenza	20	Typhoid and paratyphoid fever	28
Leprosy	2	Typhus fever (murine)	22
Malaria	178	Whooping cough	55
Measles	29	Yaws	1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 18, 1945.—During the week ended August 18, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		2		15	60	4	9	21	32	143
Diphtheria		7	4	21	1	4				37
Dysentery, bacillary									4	4
German measles					4		1	3	3	11
Influenza		6			22					28
Measles			1	10	74	2	4	6	25	122
Meningitis, meningococcus								1		1
Mumps		2	1	6	14	12	3	25	6	69
Poliomyelitis					[1] 14					[1] 14
Scarlet fever	6	4	4	35	24	10	1	7	4	95
Tuberculosis (all forms)		21	4	141	36	15	26	19	22	284
Typhoid and paratyphoid fever				8	5	1			1	15
Undulant fever				2	1					3
Venereal diseases:										
Gonorrhea	1	25	12	91	200	44	68	37	62	540
Syphilis		2	5	73	53	6	11	8	21	179
Whooping cough		2	2	141	61	2		3	4	215

[1] Includes 1 case, delayed report.

CUBA

Habana—Communicable diseases—4 weeks ended August 18, 1945.—During the 4 weeks ended August 18, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	3		Tuberculosis	7	
Malaria	1		Typhoid fever	27	4
Scarlet fever	1	1			

Provinces—Notifiable diseases—4 weeks ended August 11, 1945.—During the 4 weeks ended August 11, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			3	4		16	23
Chickenpox			1		1		2
Diphtheria		5	2	3	2	4	16
Hookworm disease		19		1			20
Leprosy		1	1			3	5
Malaria	3	1		1	3	145	153
Measles		1				3	4
Poliomyelitis						1	1
Rabies in man						1	1
Scarlet fever		1					1
Tuberculosis	16	24	30	59	41	46	216
Typhoid fever	34	94	33	106	87	75	429

[1] Includes the city of Habana.

FINLAND

Helsinki—Typhoid fever.—Information dated September 7, 1945, stated that the epidemic of typhoid fever was continuing, with 155 new cases reported on September 5 and 115 cases reported on September 6, 1945. The total number of cases reported in Helsinki to the latter date is 2,472, with additional cases reported in other cities. (See also PUBLIC HEALTH REPORTS, Sept. 14, 1945, p. 1099.)

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–June 1945	July 1945	August 1945—week ended— 4	11	18	25
ASIA							
China:							
Hupeh Province	C		14				
Kweichow Province—Kweijang	C		12				
Szechwan Province—							
Chengtu	C	P	9				
Chungking	C	8,000					
Hsin Chiaco	C	1					
Hsin Kai Shih	C	1					
Kiang Pei	C	1					
Kweyang	C	26					
Nei Kiang	C	200					
Pi Shan	C	40					
Yunnan Province	C	P					
India	C	133,347	32,317				
Bombay	C	47	15	13			
Calcutta	C	4,203	460	40	62	57	
Cawnpore	C	120	29	8	14	10	
Chittagong	C	17			1	1	
Delhi	C	57	105	20	19	17	
Madras	C	49		2			
Vizagapatam	C	13	10	3	2	1	
Indochina: Cochinchina	C	P					

PLAGUE

[C indicates cases; D, deaths; P, present]

Place		January-June 1945	July 1945	August 1945—week ended— 4	11	18	25
AFRICA							
Algeria	C	[1] 12			1		
Basutoland	C	4					
Bechuanaland	C	7					
Belgian Congo	C	8	3		2	2	1
British East Africa:							
Kenya	C	[2] 11	25	3		5	
Uganda	C	6					
Egypt	C	172					
Ismailiya	C	72	10	1			
Port Said	C	53	15	2	2	3	5
Suez	C	16	3				
French West Africa	C	5					
Dakar	C	1					
Madagascar	C	112	1				
Morocco (French)	C	501	174			[3] 97	
Senegal	C	54					
Tunisia	C	3					
Union of South Africa	C	7					
ASIA							
China:							
Foochow	C	30					
Yunnan Province [4]	C	P					
India	C	18,088	390				
Iraq	C	34					
Palestine	C	12	1	1		1	2
Plague-infected rats		17					
EUROPE							
France: Corsica—Ajaccio	C	6	2				
Great Britain: Malta	C	4	[5] 14	1	1	3	2
Portugal: Azores	C	5	3		4		
Spain: Canary Islands	C	1					
NORTH AMERICA							
Canada: Alberta Province: [6]							
Plague-infected squirrels		1	1				
SOUTH AMERICA							
Argentina:							
Buenos Aires Province—Plague-infected rats		2					
Santiago del Estero Province	C	1					
Bolivia: Santa Cruz Department	C	[7] 75					
Ecuador:							
Chimborazo Province	C	6					
Loja Province	C	2	11				
Peru:							
Ancash Department	C	1					
Ica Department	C	[8] 3	1				
Lambayeque Department	C	18					
Libertad Department	C	10	1				
Lima Department	C	11	2				
Otuzco Department	C	3					
Piura Department	C	4					
OCEANIA							
Hawaii Territory	D	[9] 1					
Plague-infected rats [10]		10	2				

[1] Includes 4 cases of pneumonic plague.
[2] Includes 5 suspected cases.
[3] For the period Aug. 1–20, 1945.
[4] Information dated July 5, 1945, stated that from April 1944 to May 1945, 85 deaths from plague had occurred in the mountainous region south of Kunming, China.
[5] Includes 4 suspected cases.
[6] During the month of June 1945, plague infection in fleas was reported in Alberta Province. For the week ended July 28, 1945, plague infection was also reported in 6 pools of fleas in Alberta Province. For the week ended Aug. 11, 1945, 2 pools of plague-infected fleas were reported in Alberta Province, Canada.
[7] Includes 6 suspected cases.
[8] Includes 1 suspected case.
[9] Previously reported as a case, death occurring on June 2, 1945.
[10] Plague infection was also proved positive in a pool of 5 mice on Jan. 4, in a pool of fleas on Feb. 14, and in a pool of 40 fleas on Mar. 14, 1945.

SMALLPOX

[C indicates cases; P, present]

Place		January–June 1945	July 1945	August 1945—week ended— 4	11	18	25
AFRICA							
Algeria	C	153	11				
Angola	C	81					
Basutoland	C	320	24				
Belgian Congo	C	4,981	203	79	24		
British East Africa:							
Kenya	C	154	12	2			
Nyasaland	C	9					
Tanganyika	C	2,853	381				
Uganda	C	669	155				
Cameroon (French)	C	334	49			[1] 366	
Dahomey	C	103	14			[1] 33	
Egypt	C	1,008	40	4			
French Equatorial Africa	C	1,526	10				
French Guinea	C	1,423	53				
French West Africa: Dakar District	C	384	6				
Gambia	C	81	1				
Gold Coast	C	29	25	25	4		30
Ivory Coast	C	422	46				
Libya	C		6				
Mauritania	C	80	3				
Morocco (French)	C	470	637			[1] 64	
Nigeria	C	3,363					
Niger Territory	C	446	26				
Rhodesia, Northern	C	874	566				
Senegal	C	447	40				
Sierra Leone	C	23	8				
Sudan (Anglo-Egyptian)	C	[2] 3					
Sudan (French)	C	1,622	304			[1] 92	
Togo (British)	C	25					
Togo (French)	C	457	25				
Tunisia	C	2					
Union of South Africa [3]	C	1,270	P	P			
ASIA							
Arabia	C	22					
Ceylon	C	[4] 379	37		95		
China	C	696					
India	C	207,473	10,182				
Iran	C	390					
Iraq	C	36			1	1	
Syria and Lebanon	C	6	2				
Turkey (see Turkey in Europe).							
EUROPE							
Belgium	C	1					
France	C	4	22				
Great Britain: Scotland	C	[2] 2					
Italy	C	1,561	21				
Sicily	C	6					
Portugal	C	19	4				
Spain	C	30					
Canary Islands	C	1					
Turkey	C	289	2				
NORTH AMERICA							
Canada	C	6					
Guatemala	C	4					
Honduras	C	8					
Mexico	C	1,066					
Nicaragua	C	123	[5] 13				
SOUTH AMERICA							
Bolivia	C	293	200				
Brazil	C	[5] 139	[5] 14				
Columbia	C	211	47	9			
Ecuador	C	21	1				
Paraguay	C	1					
Peru	C	39					
Uruguay	C	19	67				
Venezuela	C	[5] 485	[5] 24				[5 6] 28

[1] For the period Aug. 1–20, 1945.
[2] Imported.
[3] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Union of South Africa.
[4] Includes some cases of chickenpox.
[5] Includes cases of alastrim.
[6] For the month of August.

TYPHUS FEVER*

[C indicates cases; P, present]

Place		January–June 1945	July 1945	August 1945—week ended— 4	11	18	25
AFRICA							
Algeria	C	934	20				
Basutoland	C	50	1				
Belgian Congo [1]	C	135	24		27		
British East Africa: Kenya	C	27		2			
Egypt	C	14,539	455	116			
French West Africa: Dakar [1]	C	14	1				
Gold Coast	C	1					
Libya: Tripolitania	C	17		1			
Morocco (French)	C	5,089	1,247			[2] 415	
Nigeria	C	P					
Rhodesia, Northern	C	31					
Sierra Leone	C	3					
Tunisia	C	375	4				
Union of South Africa	C	517	P	P			
ASIA							
China	C	908					
India	C	22					
Iran	C	823					
Iraq	C	192	20	2	5	3	6
Palestine [1]	C	62					
Syria and Lebanon	C	12					
Trans-Jordan	C	42			1		
Turkey (see Turkey in Europe).							
EUROPE							
Albania	C	100					
Austria	C	30	16				
Belgium	C	143	14				
Bulgaria	C	928					
Denmark	C	144	1		1		
France	C	231	32	4			
Germany	C	7,579	293				
Gibraltar	C	4					
Great Britain	C	[3] 21					
Malta and Gozo [1]	C	9					
Greece	C	60	25				
Italy	C	129					
Netherlands	C	158					
Portugal	C	43	4		1		
Rumania	C	[4] 7,831					
Slovakia	C	255					
Spain	C	13					
Sweden	C	220	3				
Switzerland	C		1				
Turkey	C	2,203	102	17	26	16	27
Yugoslavia	C	1,194					
NORTH AMERICA							
Canada [1]	C	1					
Costa Rica [1]	C	5	1				
Cuba [1]	C	5	2				
Guatemala	C	1,033					
Jamaica [1]	C	21	3				
Martinique [1]	C					1	
Mexico	C	953					
Panama (Republic)	C	3					
Puerto Rico [1]	C	70	42	8		15	
Virgin Islands [1]	C	8					
SOUTH AMERICA							
Bolivia	C	293					
Brazil	C	1					
Chile [1]	C	304	28				
Colombia	C	20					
Curacao	C	1					
Ecuador	C	229	61				
Peru	C	361					
Venezuela [1]	C	75					
OCEANIA							
Australia [1]	C	75	5				
Hawaii Territory [1]	C	55	6	1	2		

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reports cases as murine type.
[2] For the period August 1–20, 1945.
[3] Includes imported cases.
[4] For the period Jan. 1–20, 1945.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January-June 1945	July 1945	August 1945—week ended— 4	11	18	25
AFRICA							
Gold Coast:							
Nsawam	C	2	[1]1				
Takoradi	C	1					
Winneba	C	1		1	[1]1		1
Ivory coast:							
Gaoua	C	1					
Guiglo	C	1					
Sierra Leone: Moyamba	C	2					
SOUTH AMERICA							
Brazil:							
Goiaz State	D	76					
Minas Geraes State	D	25					
Para State	D		1				
Colombia:							
Magdalena Department	D		2				
Santander de Norte Department	D	10	1				
Peru:							
Cuzco Department	C	3					
Loreto Department	C	1					
Venezuela:							
Bolivar State	C	1					
Merida State	C		2				
Tachira State	D	14	6				
Zulia State	C		6				

[1] Suspected.

STUDIES OF TYPHUS FEVER[1]

A Review

National Institute of Health Bulletin No. 183, entitled: "Studies of Typhus Fever" has recently been released for circulation. It represents part of the work on the rickettsial diseases done at the National Institute of Health since the outbreak of the war. After the restrictions on this type of information were lifted, it seemed appropriate to collect the studies on typhus fever and issue them as a report of work accomplished.

The bulletin contains the following articles:

Studies of typhus fever vaccines. By N. H. Topping, I. A. Bengtson, and M. J. Shear.

Section I. Tests on available vaccines.

Section II. On the addition of alum to Cox vaccine.

Section III. Studies of antigens in infected yolk sacs.

Section IV. Studies of the relationship of the abundance of rickettsiae in yolk sacs infected with epidemic and endemic typhus and the complement fixation reaction.

Epidemic typhus: Demonstration of a substance lethal for mice in the yolk sac of eggs infected with *Rickettsia prowazeki.* By I. A. Bengtson, N. H. Topping, and R. G. Henderson.

Notes on the preparation of epidemic typhus vaccine. By N. H. Topping.

Notes on the mouse test with typhus vaccines. By R. G. Henderson.

Epidemic typhus vaccine: Preparation of seed virus for the inoculation of eggs and of lethal material for the neutralization test in mice. By I. A. Bengtson.

Epidemic typhus fever: Neutralization of the toxic substance. By R. G. Henderson and N. H. Topping.

Epidemic typhus fever: A study of the antigenicity of various strains of typhus virus. By N. H. Topping, I. A. Bengtson, and R. G. Henderson.

Epidemic typhus fever: Studies of epidemic typhus vaccine. By N. H. Topping, R. G. Henderson, and I. A. Bengtson.

Technic of a precipitin test for the study of typhus fever. By C. C. Shepard and N. H. Topping.

Typhus fever: Antigens of the rickettsiae of typhus fever and the changes produced by heat. By C. C. Shepard.

INDUSTRIAL HYGIENE BIBLIOGRAPHY[2]

A Review

A bibliography of industrial hygiene covering selected books and articles produced in the years 1900–43 is presented in Public Health Bulletin No. 289.

The bulletin was prepared by the Industrial Hygiene Division, Bureau of State Services, United States Public Health Service, in

[1] Studies of typhus fever. By N. H. Topping, I. A. Bengtson, R. G. Henderson, C. C. Shepard, and M. J. Shear. National Institute of Health Bulletin No. 183. Government Printing Office, 1945. For sale by the Superintendent of Documents, Washington 25, D. C. Price 20 cents.

[2] Bibliography of industrial hygiene, 1900–43; a selected list. Pub. Health Bull. No. 289. Government Printing Office, 1945. For sale by the Superintendent of Documents, Washington 25, D. C. Price 20 cents.

response to demand from industrial hygienists, governmental health and labor personnel, physicians, industrial management, and labor for dependable references on industrial hygiene subjects.

Part I contains general sources of information in this field, including reference volumes useful to an industrial hygiene library, periodicals representing all phases of industrial hygiene interest and activity, sources from which pamphlets and other reference materials may be obtained, a list of governmental industrial hygiene agencies, educational and research organizations, insurance groups active in industry, and libraries.

Part II is a listing of articles and books on specific industrial hygiene subjects. It includes materials on such problems as absenteeism and morbidity; aviation medicine; dermatoses; dust problems in particular industries, determination and control of dusts, and dust diseases; various other diseases, occupational and nonoccupational, as they apply to industry; eye problems; fatigue; hazardous substances, organic and inorganic, and such substances as are found in particular industries and processes, with methods of sampling and analysis; health education; industrial hygiene services; legislation; ventilation; and women in industry.

A number of important papers which appeared early in 1944, when the bibliography was in preparation, have been included.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

VOLUME 60 **OCTOBER 5, 1945** NUMBER 40

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Public Health Reports

Vol. 60 • OCTOBER 5, 1945 • *No. 40*

THE THERAPEUTIC EFFECT OF PROMIN IN LEPROSY

By G. H. Faget, *Medical Director*, and R. C. Pogge, *Passed Assistant Surgeon (R)*, *United States Marine Hospital (National Leprosarium), Carville, La.*

In November 1943 a preliminary progress report on the treatment of leprosy with promin (*1*) was published, in which improvements were reported in a considerable percentage of cases. The present report is an extension of this earlier paper with an attempt at an explanation of the mode of action of promin. This report is based on the treatment of 137 patients at the National Leprosarium who have received 32,000 intravenous injections of promin totaling 126,961 gm. The average daily dose per patient, including days of rest, when no promin was given, varied from 0.4 gm. to 4.6 gm. The dosage of promin was usually started at 1 gm. daily intravenously and gradually increased in an attempt to reach the optimal dosage of 5 gm. daily. In some patients, who developed repeated toxic reactions, the maximum daily dose of promin did not exceed 2 gm. The size of the daily dose in individual cases, therefore, depended mostly upon the patient's tolerance to the drug. Thus the routine technique at the present time consists of daily intravenous injections of promin in doses varying from 2 to 5 gm., for 6 days a week, in courses of 2 weeks' duration, with 1 week of rest between courses. Since this technique has been adopted toxic reactions have been few and of a minor nature. The week of rest usually allows sufficient time for the hematopoietic system to restore the blood cells lost through the hematolytic action of promin.

The present study shows that the improvements observed in the earlier report continue to occur, and in a larger percentage of cases than previously reported. Thus, the longer the duration of treatment, the greater seems to be the percentage of improvement. It is also observed that it is in the group of patients receiving the larger doses of the drug that the most consistent improvement occurred.

TABLE 1.—*Relation of average daily dose of promin to improvement*

Average daily dose of promin (gm.)	Total patients treated			Patients treated less than 6 months			Patients treated more than 6 months		
	Number of patients	Number improved	Percent improved	Number of patients	Number improved	Percent improved	Number of patients	Number improved	Percent improved
0.4 to 0.9	12	5	41.7	5	2	60	7	3	43
1 to 1.9	65	36	55.7	9	1	11	56	35	62.5
2 to 2.9	42	32	76.2	13	6	46	29	26	89.3
3 to 4.6	18	7	39	12	1	8.3	6	6	100
Total	137	80	58.4	39	10	25.6	98	70	71.4

TABLE 2.—*Relation of duration of treatment to improvement*

Duration of treatment	Number of patients	Percent improved
Less than 6 months	38	25.6
6 months to 1 year	36	63.9
1 to 2 years	14	71.4
2 to 3 years	42	73.8
3 to 4 years	6	100
Total	137	58.4

TABLE 3.—*Relation of total dosage of promin to improvement*

Total dosage (gm.)	Number of patients	Number improved	Percent improved
Less than 500	52	15	28.8
500 to 1,000	40	29	72.5
1,000 to 2,000	21	16	76.2
2,000 to 5,000	24	20	83.33
Total	137	80	58.4

From the above tables it is evident that promin produced improvement in the majority of treated patients. The improvement increased in proportion to the duration of treatment, the total dosage of promin, and, to a less extent, the size of the average daily dose administered.

There were only two patients in whom it was evident that the disease became worse under treatment. Each of these patients had an advanced mixed type of leprosy with laryngeal involvement. Treatment had to be discontinued in each case because of toxic reactions after 1 month and 3½ months of treatment, respectively; therefore, adequate treatment was not given in either case. On the other hand, two cases of lepromatous leprosy became arrested following 17 and 29 months of promin therapy, respectively.

During over 3 years of experimental study at the National Leprosarium accumulated data indicate that improvement under promin therapy in leprosy is definite and is not attributable to spontaneous or coincidental favorable changes in the course of the disease. It is the purpose of this paper to discuss the probable mode of action of promin in leprosy.

In the experimental treatment of such a chronic disease as leprosy, whenever new remedies are tried, there are five possibilities to be considered in explanation of a favorable response. These are:

1. Improvement due to psychological response of patient.
2. Improvement due to spontaneous remission of the disease.
3. Improvement purely symptomatic and lacking objective substantiation.
4. Improvement limited to effect on secondary infection or other complicating conditions.
5. Improvement due to chemotherapeutic or other specific action on the disease.

These different possibilities in the case of promin therapy of leprosy will be discussed separately.

Improvement due to psychological response of the patient.—Even though some patients claim greater symptomatic improvement than is objectively evident, this does not explain all of the action of promin in leprosy. The medical staff has based its opinion of improvement mainly on objective findings, which are often confirmed by photographic and laboratory data.

Although early favorable response from the patient's standpoint has been noted with other experimental treatments at the National Leprosarium, these have not withstood the test of time. In such instances the patients themselves sooner or later discovered that they were mistaken and their enthusiasm was replaced by disappointment. This has not been the case with promin which has now been in use for over 3 years. Patients continue to have faith in it since they have noticed that the improvement has not been short-lived, but is progressive.

With other experimental treatments given over a moderate period of time, even to a much smaller number of patients, progressive advance of the disease has been noted in spite of treatment in a considerable percentage of cases. With promin, on the contrary, this is unusual, only two patients, or 1.46 percent of cases, becoming worse. Other experimental treatments have been abandoned by the medical staff as valueless in a much shorter period of time than that during which promin has now been employed at the National Leprosarium.

For these reasons the effects of promin in leprosy cannot be considered to be on a purely psychological basis.

Spontaneous remissions.—The patients who first volunteered for promin treatment were those who were not doing satisfactorily on routine treatment. They were for the most part far advanced cases of lepromatous or mixed types. It is not in such a group of patients that spontaneous remissions are likely to occur. The preliminary report (*1*) showed that promin and a related drug (Internal Antiseptic 307) produced better results than were obtained in a control group of patients.

Only 2 of the 137 patients treated were of the purely neural type.

The lepromatous and mixed cases were the types especially selected for treatment. Since patients with these types of the disease carry the worst prognosis and are the least liable to undergo spontaneous remissions, the improvements noted in them cannot be attributed to this cause.

Improvement purely symptomatic and lacking in objective substantiation.—That the good effects of promin are not entirely of a symptomatic nature is shown in the fact that they are evident to the doctor as well as to the patient. It is true that many patients report improvement in their general health, increase in appetite, greater strength and energy, more restful sleep, and less upper respiratory difficulty, but these symptomatic improvements are thought to result secondarily from effects of promin on the disease processes in the body.

Not only is objective improvement shown in the healing of leprous ulcerations but also in the subsidence of leprous lesions in the form of nodules and infiltrations. Experience with promin therapy is that the nodules of leprosy either remain unchanged or flatten out and become smaller and at times are completely absorbed. At other times the nodules disintegrate and are replaced by scar tissue. These changes are demonstrated in serial photographs. Definite improvement in ocular, laryngeal, nasal, and oral manifestations of the disease have also been noted. The improvement attributed to promin is therefore objective and not purely subjective.

Effects limited to secondary infection or other complicating conditions.—Secondary infection is not uncommon in leprosy and probably accounts for some of the patient's feeling of illness. It is also probable that secondary infection frequently prevents the healing of leprous and trophic ulcers, which, when active, are a drain on the patient's general health. Promin is not the only chemotherapeutic agent which is helpful in the healing of ulcerations in leprosy. Sulfanilamide, sulfathiazole, sulfadiazine, and penicillin, employed both locally and systemically, are even more potent than promin in clearing up secondary pyogenic infection and in healing chronic ulcerations. After prolonged experience, however, it is found that these other drugs show little, if any, of the effects of promin on the nodular lesions of leprosy. Furthermore, there appears to be less tendency for ulcers to recur when healed under the influence of promin than when they are healed under the influence of these other chemotherapeutic agents. The benefits of promin therapy cannot, therefore, be attributed entirely to its effect on secondary infection nor does it seem that its action is limited to its effects on other complicating diseases.

Chemotherapeutic effect of promin in leprosy.—Since the first four hypotheses do not fully explain the improvement produced by promin in leprosy, it is possible that a chemotherapeutic action is tenable.

The action of promin in leprosy has been observed to produce favorable changes on the specific lesions, the granulomatous nodules of the disease. This improvement may be due to a bacteriostatic or bacteriolytic action on Hansen's bacillus, but there is no way to prove this because the causative germ cannot be cultivated, and the disease cannot be reproduced in laboratory animals by inoculation of human leprous material.

Among the 62 patients treated for more than 1 year, there has occurred a reversal of the bacterioscopy from positive to negative on several consecutive monthly examinations in over 10 percent of the cases. An additional 30 percent have had occasional negative tests since starting on the promin treatment. These laboratory findings tend to show that in at least 40 percent of cases there has occurred a diminution in the number of infective organisms in the lesions of the disease. This suggests that promin has some chemotherapeutic action in leprosy.

False positive serologic reactions for syphilis have frequently been reported in leprosy. In a report from the National Leprosarium (*2*) it was shown that fluctuations in the degree of the positive serology are closely correlated to the clinical activity of leprosy. A higher percentage of positive tests was present in advanced cases. A reversion from a positive to a negative serology frequently accompanied improvement or arrest of the disease. Hence, a comparison of changes in serology in promin-treated patients with those not so treated is of interest, as shown in the following table:

TABLE 4.—*Effect of promin on serologic reaction in leprosy*

A. PROMIN-TREATED PATIENTS

Number patients	Kahn test			Kolmer test		
	Positive		Negative	Positive		Negative
	Number	Percent		Number	Percent	
137	67	48.9	70	65	48.2	70

REPEATED SEROLOGIC TESTS

Number patients	Kahn test					Kolmer test					
	No change		Changed from—			No change		Changed from—			
	Positive, remaining positive	Negative, remaining negative	Positive to negative		Negative to positive	Positive, remaining positive	Negative, remaining negative	Positive to negative		Negative to positive	
			Number	Percent				Number	Percent	Number	Percent
37	16	11	8	21.6	0	12	11	12	34.2	2	5.7

TABLE 4.—*Effect of promin on serologic reaction in leprosy*—Continued

B. CONTROL GROUP OF PATIENTS

Number patients	Kahn test			Kolmer test		
	Positive		Negative	Positive		Negative
	Number	Percent		Number	Percent	
240	108	45.0	132	101	44.3	127

REPEATED SEROLOGIC TESTS

Number patients	Kahn test						Kolmer test					
	No change		Changed from—				No change		Changed from—			
	Positive, remaining positive	Negative, remaining negative	Positive to negative		Negative to positive		Positive, remaining positive	Negative, remaining negative	Positive to negative		Negative to positive	
			Number	Percent	Number	Percent			Number	Percent	Number	Percent
100	35	41	8	8.0	16	16.0	33	42	10	10.0	15	15.0

From the above table it is apparent that when changes in serology occurred in the control groups of patients there was a greater tendency for negative tests to become positive (leprosy progressing unfavorably) than vice versa. This occurred in the proportion of 16 to 8 percent and 15 to 10 percent in the two tests respectively, whereas in the promin-treated group of patients the tendency was definitely in favor of the serology reverting to negative (leprosy improving) under treatment. Attention is drawn to the fact that at the beginning of the promin treatment 48.9 percent of the treated patients were seropositive as compared to 45 percent of the control group of patients. This indicates that the initial prognosis of treated patients was no more favorable than that of the patients as a whole. Yet after prolonged treatment with promin a favorable change in serology was definitely more frequent in the promin-treated group than in those not treated with promin.

DISCUSSION

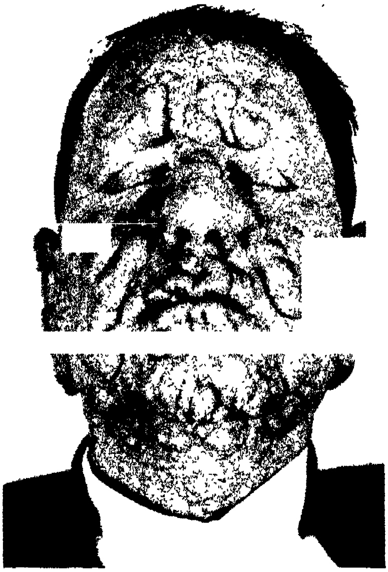
No claim is made that promin is a specific remedy for leprosy although it has been shown to have a favorable effect in this disease. Its action is slow and improvements usually become manifest only after 6 or more months of treatment. It must be remembered, however, that even if a drug were found which was bacteriocidal for *M. leprae* it would of necessity work slowly. Leprosy attacks principally the skin and peripheral nervous system, access to which, through the blood stream, is inferior to that of the more highly vascular organs

Case 986. Before February 1944. Far advanced case.

Case 986. After February 1945. Total promin 825 gm.

Case 1019. Before treatment. Lesions 2½ years' duration. Moderately advanced lepromatous type.

Case 1019. After 1 year's treatment. Total promin 921 gm.



Case 493. Before treatment. Lesions 8 years' duration. Far advanced lepromatous type.

Case 493. After 1 year's treatment. Total promin 790 gm.

Case 1593. Before treatment. Lesions 1 year's duration. Early minimal lepromatous type.

Case 1593. After 3 months' treatment. Total promin 155 gm.

of the body. Hansen's bacillus, which is generally considered to be the causative agent of leprosy, is a very resistant type of micro-organism which is covered by a protective waxy capsule. In perhaps no other bacterial disease of man are the causative micro-organisms found in such abundance in the lesions of the disease as they are in leprosy. The incubation period of leprosy is a long one and the course of the disease is of slow evolution, usually requiring years to reach an advanced stage. Furthermore, the patients treated at the National Leprosarium have had the disease for an average of more than 4 years at the time of their admission. All of the above circumstances would tend to deter the chemotherapeutic action of any remedy under trial.

The term "specific" has been used professionally as applicable to a drug which has a direct chemotherapeutic action against the etiologic agent of a disease. Since *M. leprae* cannot be cultivated on artificial media, nor can the human disease be reproduced in laboratory animals, it becomes difficult to prove any bacteriostatic or bacteriocidal action against it. For this reason promin cannot be proved to be a specific for leprosy but there is evidence that it has at least an inhibitory effect on the progress of the disease and even causes retrogression in some lesions, suggestive of chemotherapeutic action. In confirmation of the objective improvement produced by promin the accompanying photographs are submitted.

There is hope that continued scientific research will produce a faster-acting, more specific drug for the mycobacterial diseases. In the meanwhile promin must be considered the best experimental treatment ever tested at the National Leprosarium. Preliminary studies suggest that diasone has a similar action to promin and further trial may prove that it is a more satisfactory remedy than promin.

CONCLUSION

Evidence of clinical improvement in a study of 137 leprosy patients treated with promin indicates that at present it is the treatment of choice for this disease. While it cannot be proved that promin possesses any chemotherapeutic properties against leprosy this seems to be the logical explanation for its mode of action in this disease. It is hoped, however, that further research will discover a still more powerful chemotherapeutic drug for the mycobacterial diseases.

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(*1*) Faget, G. H., Pogge, R. C., Johansen, F. A., Dinan, J. F., Prejean, B. M., and Eccles, C. G.: The promin treatment of leprosy. A progress report. Pub. Health Rep., 58: 1729 (Nov. 26, 1943).

(*2*) Faget, G. H., and Ross, H.: Evaluation of positive Kolmer and Kahn tests in leprosy. Ven. Dis. Inf., 25: 133 (May 1944).

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There is presented herewith a list of the establishments holding licenses issued by the Federal Security Agency in accordance with section 351 of an Act of Congress approved July 1, 1944, entitled "Public Health Service Act" (58 Stat. 682). Section 351 of this act is designed to regulate the sale of viruses, serums, toxins, or analogous products, or arsphenamine or its derivatives (or any other trivalent organic arsenic compound) in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes.

The licenses granted to these establishments for the products mentioned do not imply an endorsement for the respective preparations. The granting of a license means that the establishment is inspected regularly as to the technical ability of the responsible personnel and as to the sanitary condition of the premises; it means that all products are manufactured by methods considered to be safe; it means that tests have been applied to the finished products to insure their safety and purity; it means that in all instances where there is an official standard of potency, or where an official test of potency is recognized, the products have been tested against such standards or by such a test; it means that the establishment also is required to carry out any other requirements specified by the National Institute of Health, designed to insure the continued safety, purity, and potency of the licensed products.

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2. *Vaccines made from viruses and rickettsiae.*—Rabies (Cumming); rabies (killed virus); smallpox; typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; acne diplococcus; Brucella abortus; Brucella melitensis; cholera vibrio; colon bacillus; dysentery bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphod bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; prodigiosus bacillus; pseudodiphthera bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Colon bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus.
5. *Modified bacterial derivatives made from.*—Colon bacillus; gonococcus; paratyphoid bacillus A; paratyphoid bacillus B; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
6. *Tuberculin preparations.*—Tuberculin B. F.; tuberculin old; tuberculin-purified protein derivative.
7. *Toxins, toxoids and venoms.*—Diphtheria toxin-antitoxin mixture; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.
8. *Allergenic extracts and analogous products.*—Allergenic extracts (including animal derivatives, foods, and pollens); poison ivy extract; Trichinella extract.
9. *Trivalent organic arsenicals.*—Dichlorophenarsine hydrochloride; oxophenarsine hydrochloride.

Sharp and Dohme, Philadelphia, Pa.—License No. 2:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Botulism; diphtheria; dysentery, Shiga; erysipelas streptococcus; B. histolyticus; B. odematiens; perfringens; scarlet fever streptococcus; V. septique; B. sordellii; tetanus. **Therapeutic serums and analogous products:** Antianthrax; antibrucella; antidysenteric; antierysipeloid; anti-Hemophilus influenzae type b; antimeningococcic; anti-Rocky Mountain spotted fever; antitularemic; antityphus; antivenin (Bothropic); antivenin (Crotalus terrificus); antivenin (Latrodectus mactans); antivenin (Nearctic crotalidae). Albumin, normal serum; cells, human blood; fibrin foam; globulin, immune (human); globulin, immune serum (human); plasma, normal human; serum, measles immune (human); serum, meningococcus typing; serum, normal horse; serum, normal human; serum, scarlet fever immune (human); thrombin.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); rabies (Pasteur); Rocky Mountain spotted fever; smallpox; typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; Brucella abortus; Brucella suis; cholera vibrio; colon bacillus; dysentery bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; B. tularense; typhoid bacillus.
4. *Bacterial antigens made from.*—Acne bacillus; Brucella abortus; Brucella melitensis; Brucella suis; colon bacillus; dysentery bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; proteus bacillus; pyocyaneus bacillus; staphylococcus aureus; streptococcus; typhoid bacillus.
5. *Sensitized bacterial vaccines made from.*—Acne bacillus; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
6. *Tuberculin preparations.*—Tuberculin B. E.; tuberculin B. F.; tuberculin old; tuberculin-purified protein derivative; tuberculin T. R.
7. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid; bee venom.
8. *Allergenic extracts and analogous products.*—Poison ivy extract; poison oak extract.

Cutter Laboratories, Berkeley, Calif.—License No. 8:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; B. odematiens; perfringens; scarlet fever streptococcus; V. septique; tetanus. **Therapeutic serums and analogous products:** Antianthrax; antimeningococcic; antipertussis. Albumin, normal serum; fibrin foam; globulin, immune serum (human); plasma, normal human; serum, normal horse; thrombin.
2. *Vaccines made from viruses and rickettsiae.*—Equine encephalomyelitis; rabies (killed virus); smallpox.
3. *Bacterial vaccines made from.*—Acne bacillus; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; plague bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Colon bacillus; staphylococcus aureus.
5. *Tuberculin preparations.*—Tuberculin old.
6. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxiod; tetanus toxoid.
7. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison oak extract.

Bureau of Laboratories, Department of Health, New York City.—License No. 14:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; tetanus. **Therapeutic serums and analogous products:** Antimeningococcic; antipneumococcic; serum, normal horse.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); smallpox.
3. *Bacterial vaccines made from.*—Paratyphoid bacillus A; paratyphoid bacillus B; typhoid bacillus.
4. *Tuberculin preparations.*—Tuberculin old.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxoid; tetanus toxoid.

Lederle Laboratories, Pearl River, N. Y.—License No. 17:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Botulism; diphtheria; dysentery, Shiga; erysipelas streptococcus; B. histolyticus; B. odematiens; perfringens; scarlet fever streptococcus; V. septique; B. sordellii; staphylococcus; tetanus. **Therapeutic serums and analogous products:** Antianthrax; antidysenteric; anti-Hemophilus influenzae type b; antimeningococcic; antipneumococcic; anti-Rocky Mountain spotted fever; antistaphylococcic; antityphus. Albumin, normal serum; globulin, hemostatic; globulin, immune (human); globulin, immune serum (human); plasma, normal human; serum, Hemophilus influenzae typing; serum, meningococcus typing; serum, normal horse; serum, pneumococcus typing.

2. *Vaccines made from viruses and rickettsiae.*—Encephalitis, herpes "F" strain; equine encephalomyelitis; rabies (killed virus); smallpox; Rocky Mountain spotted fever; typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; Brucella abortus; Brucella melitensis; Brucella suis; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; staphylococcus citreus; streptococcus; typhoid bacillus.
4. *Bacterial antigen made from.*—Pertussis bacillus.
5. *Tuberculin preparations.*—Tuberculin old.
6. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid; snake venom solution.
7. Allergenic extracts and analogous products.—Allergenic extracts (including pollens, animal derivatives, foods, vegetable derivatives, miscellaneous substances); poison ivy extract; poison oak extract; Trichinella extract.

Sherman Laboratories (G. H. Sherman, M. D., Founder), Detroit, Mich.—License No. 30:

1. *Bacterial vaccines made from.*—Acne bacillus; Brucella abortus; Brucella melitensis; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
2. *Bacterial antigens made from.*—Colon bacillus; gonococcus; micrococcus catarrhalis; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus.
3. *Toxins, toxoids and venoms.*—Diphtheria toxoid; staphylococcus toxoid.
4. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison oak extract.

Abbott Laboratories, North Chicago, Ill.—License No. 43:

1. *Antitoxins, therapeutic serums, and analogous products.*—Plasma, normal human; thrombin.
2. *Bacterial vaccines made from.*—Friedländer bacillus; influenza bacillus; micrococcus catarrhalis; micrococcus tetragenus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus.
3. *Toxins, toxoids, and venoms.*—Tetanus toxoid.
4. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens, animal derivatives, foods, and miscellaneous substances); poison ivy extract.
5. *Trivalent organic arsenicals.*—Arsphenamine; arsphenamine, bismuth sulfonate; arsphenamine, neosilver; arsphenamine, silver; dichlorophenarsine hydrochloride; neoarsphenamine; sulfarsphenamine; sulfarsphenamine, trisodium.

Upjohn Co., Kalamazoo, Mich.—License No. 51:

1. *Antitoxins, therapeutic serums, and analogous products.*—Albumin, normal serum; fibrin foam; globulin, immune serum (human); thrombin.
2. *Bacterial vaccines made from.*—Colon bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
3. *Toxins, toxoids, and venoms.*—Diphtheria toxoid.

E. R. Squibb and Sons' Research and Biological Laboratories, New Brunswick, N. J.—License No. 52:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; erysipelas streptococcus; B. odematiens; perfringens; scarlet fever streptococcus; V. septique; staphylococcus; tetanus. **Therapeutic serums and analogous products:** Anti-Hemophilus influenzae type b; antimeningococcic; antipertussis; antipneumococcic; antistreptococcic; antivenin (Latrodectus mactans). Albumin; normal serum; fibrin foam; globulin, immune (human); globulin; immune serum (human); leucocyte extract; serum, normal horse; serum, pneumococcus typing; thrombin.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); rabies (Pasteur); smallpox; typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; staphylococcus citreus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Staphylococcus aureus.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin-antitoxin mixture; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.
6. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison oak extract.
7. *Trivalent organic arsenicals.*—Arsphenamine; dichlorophenarsine hydrochloride; neoarsphenamine sulfarsphenamine.

Eli Lilly and Co., Indianapolis, Ind.—License No. 56:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; B. odematiens; perfringens; V. septique; tetanus. **Therapeutic serums and analogous products:** Antimeningococcic. Albumin, normal serum; globulin, immune serum (human); plasma, normal human; serum, hemostatic (Lilly); serum, normal horse.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (modified Harris); smallpox, typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Acne bacillus; colon bacillus; gonococcus; influenza bacillus, micrococcus catarrhalis; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus.
5. *Tuberculin preparations.*—Tuberculin old.
6. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxoid; tetanus toxoid.
7. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens and miscellaneous substances); fungus antigens; Trichinella extract.

Antitoxin and Vaccine Laboratory, Department of Public Health, Commonwealth of Massachusetts, Boston, Mass.—License No. 64:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; scarlet fever streptococcus. **Therapeutic serums and analogous products:** Anti-Hemophilus influenzae type b; antimeningococcic; antipneumococcic. Albumin, normal serum; globulin, immune (human); globulin, immune serum (human); serum, pneumococcus typing.
2. *Vaccines made from viruses and rickettsiae.*—Smallpox.
3. *Bacterial vaccines made from.*—Paratyphoid bacillus A; paratyphoid bacillus B; typhoid bacillus.
4. *Tuberculin preparations.*—Tuberculin old.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin-antitoxin mixture; diphtheria toxin for Schick test; diphtheria toxoid.

United States Standard Products Co., Woodworth, Wis.—License No. 65:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; perfringens; V. septique; tetanus. **Therapeutic serums and analogous products:** Antimeningococcic.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); smallpox.
3. *Bacterial vaccines made from.*—Acne bacillus; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Staphylococcus albus; staphylococcus aureus.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; tetanus toxoid.
6. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison oak extract.

D. L. Harris Laboratories, St. Louis, Mo.—License No. 66:
Rabies vaccine (Harris).

Arlington Chemical Co., Yonkers, N. Y.—License No. 67:

1. *Bacterial vaccines made from.*—Colon bacillus; Friedländer bacillus; micrococcus catarrhalis; micrococcus tetragenus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; staphylococcus citreus; streptococcus.
2. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens, animal derivatives, foods, and miscellaneous substances); poison ivy extract.

Winthrop Chemical Co., Inc., Rensselaer, N. Y.—License No. 69:

1. *Trivalent organic arsenicals.*—Acetylglycarsenobenzene; arsphenamine; arsphenamine, diglucoside; arsphenamine, silver; dichlorophenarsine hydrochloride; neoarsphenamine; sulfarsphenamine.

Diarsenol Co., Inc., Buffalo, N. Y.—License No. 70:

1. *Trivalent organic arsenicals.*—Arsphenamine; arsphenamine, sodium; neoarsphenamine; sulfarsphenamine.

Merck and Co., Inc., Rahway, N. J.—License No. 82:

1. *Trivalent organic arsenicals.*—Arsphenamine; neoarsphenamine; sulfarsphenamine.

Terrell Laboratories, Fort Worth, Tex.—License No. 84:
Rabies vaccine (killed virus).

Jensen-Salsbery Laboratories, Kansas City, Mo.—License No. 85:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Botulism. **Therapeutic serums and analogous products:** Antibrucella; antierysipeloid.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus).
3. *Bacterial vaccines made from.*—Brucella abortus; Brucella suis.

Hollister-Stier Laboratories, Spokane, Wash., Los Angeles, Calif., and Wilkinsburg, Pa.—License No. 91:

1. *Antitoxins, therapeutic serums, and analogous products.*—Serum, poliomyelitis immune (human).
2. *Bacterial vaccines made from.*—Acne bacillus; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; xerosis bacillus.
3. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens, animal derivatives, foods, and miscellaneous substances) poison ivy extract; poison oak extract.

Medical Arts Laboratory, Oklahoma City, Okla.—License No. 98:

1. Rabies vaccine (killed virus).

Bureau of Laboratories, Michigan State Department of Health, Lansing, Mich.—License No. 99:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; scarlet fever streptococcus; tetanus. **Therapeutic serums and analogous products:** Antimeningococcic; antipneumococcic. Plasma, normal human; serum, pneumococcus typing.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (Cumming); smallpox.
3. *Bacterial vaccines made from.*—Pertussis bacillus; typhoid bacillus.
4. *Tuberculin preparations.*—Tuberculin old.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; Scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; tetanus toxoid.

National Drug Co., Philadelphia, Pa.—License No. 101:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; B. odematiens perfringens; scarlet fever streptococcus; V. septique; staphylococcus; tetanus. **Therapeutic serums and analogous products:** Antimeningococcic; antipneumococcic. Globulin, immune (human); serum, normal horse; serum, pneumococcus typing.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); smallpox.
3. *Bacterial vaccines made from.*—Acne bacillus; Brucella abortus; Brucella melitensis; Brucella suis; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; meningococcus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; pyocyaneus bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Bacterial antigens made from.*—Staphylococcus aureus.
5. *Tuberculin preparations.*—Tuberculin old.
6. *Toxins, toxoids, and venoms.*—Diphtheria toxin-antitoxin mixture; diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; streptococcus erythrogenic; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.
7. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens and miscellaneous substances).

Mulford Colloid Laboratories, Philadelphia, Pa.—License No. 102:

Poison ivy extract; poison oak extract.

Allergy Laboratories, Oklahoma City, Okla.—License No. 103:

Allergenic extracts (including pollens, foods, animal derivatives, and miscellaneous substances).

C. F. Kirk Co., New York, N. Y.—License No. 105:

1. *Bacterial vaccines made from.*—Acne bacillus; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
2. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens).

Porro Biological Laboratories, Tacoma, Wash.—License No. 107:

1. *Bacterial vaccines made from.*—Micrococcus catarrhalis; pneumococcus; staphylococcus aureus; streptococcus.
2. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens, animal derivatives, foods, and miscellaneous substances).

Central Pharmacal Co., Seymour, Ind.—License No. 109:

1. *Bacterial antigens made from.*—Colon bacillus; Friedländer bacillus; gonococcus; micrococcus catarrhalis; pertussis bacillus; pneumococcus; pyocyaneus bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.

Pitman-Moore Co., Division of Allied Laboratories, Inc., Zionsville, Ind.—License No. 110:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; perfringens; V. septique; tetanus. **Therapeutic serums and analogous products:** Antierysipeloid. Globulin, immune (human); serum, normal horse.
2. *Vaccines made from viruses and rickettsiae.*—Equine encephalomyelitis; rabies (killed virus); typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; Brucella abortus; Brucella melitensis; Brucella suis; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; micrococcus catarrhalis; micro-

coccus tetragenus; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.

4. *Bacterial antigens made from.*—Colon bacillus; gonococcus; staphylococcus albus; staphylococcus aureus; streptococcus.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.
6. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison oak extract.

Wm. S. Merrell Co., Cincinnati, Ohio.—License No. 111:

1. *Bacterial vaccines made from.*—Friedländer bacillus; influenza bacillus; micrococcus catarrhalis; pneumococcus; staphylococcus albus; staphylococcus aureus; streptococcus.

Michael Reese Research Foundation, Chicago, Ill.—License No. 113:

1. *Antitoxins, therapeutic serums, and analogous products.*—Plasma, normal human; serum, measles immune (human); serum, mumps immune (human); serum, normal human; serum, poliomyelitis immune (human); serum, scarlet fever immune (human).

Milwaukee Serum Center, Columbia Hospital, Milwaukee, Wis.—License No. 117:

1. *Antitoxins, therapeutic serums, and analogous products.*—Serum, measles immune (human); serum, mumps immune (human); serum, normal human; serum, pertussis immune (human); serum, poliomyelitis immune (human); serum, scarlet fever immune (human).

Barry Allergy Laboratory, Detroit, Mich.—License No. 119:

1. *Bacterial vaccines made from.*—Friedländer bacillus; influenza bacillus; micrococcus catarrhalis; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; staphylococcus citreus; streptococcus.
2. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens); poison ivy extract; poison sumac extract.

Biological Laboratory, Illinois Department of Health, Chicago, Ill.—License No. 120:

1. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus).
2. *Bacterial vaccines made from.*—Paratyphoid bacillus A; paratyphoid bacillus B; typhoid bacillus.
3. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxoid.

State Department of Health, Austin, Tex.—License No. 121:

1. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus).
2. *Bacterial vaccines made from.*—Paratyphoid bacillus A; paratyphoid bacillus B; typhoid bacillus.
3. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; diphtheria toxoid.

Hynson, Westcott and Dunning, Baltimore, Md.—License No. 125:

Snake venom solution.

R. J. Strasenburgh Co., Rochester, N. Y.—License No. 127:

Bee venom ointment.

Research Foundation of Toledo Hospital, Inc., Toledo, Ohio.—License No. 128:

1. *Bacterial antigen made from.*—Colon bacillus.

A. W. Kretschmar, Inc., New York, N. Y.—License No. 132:

Bee venom solution.

Michigan State College, East Lansing, Mich.—License No. 133:

1. *Bacterial antigens made from.*—Brucella melitensis.

Bio-therapeutic Laboratories, East Orange, N. J.—License No. 135:

1. *Bacterial antigens made from.*—Pyocyaneus bacillus; staphylococcus albus; staphylococcus aureus; staphylococcus citreus; streptococcus.

Iowa State Department of Health Serum Center, Des Moines, Iowa.—License No. 137:

1. *Antitoxins, therapeutic serums, and analogous products.*—Serum, measles immune (human); serum, normal human; serum, pertussis immune (human); serum, poliomyelitis immune (human); serum, scarlet fever immune (human).

University of Minnesota Human Serum Laboratory, Minneapolis, Minn.—License No. 138:

1. *Antitoxins, therapeutic serums, and analogous products.*—Serum, measles immune (human); serum, normal human; serum, mumps immune (human); serum, pertussis immune (human); serum, poliomyelitis immune (human); serum, scarlet fever immune (human).

Philadelphia Serum Exchange, The Children's Hospital, Philadelphia, Pa.—License No. 139:

1. *Antitoxins, therapeutic serums, and analogous products.*—Serum, measles immune (human); serum, normal human; serum, mumps immune (human); serum, pertussis immune (human); serum, scarlet fever immune (human).

Hyland Laboratories, Los Angeles, Calif.—License No. 140:

1. *Antitoxins, therapeutic serums, and analogous products.*—Plasma, normal human; serum, chickenpox immune (human); serum, measles immune (human); serum, mumps immune (human); serum, normal human; serum, pertussis immune (human); serum, poliomyelitis immune (human); serum, scarlet fever immune (human).

Venomin Co., Venice, Fla.—License No. 141:

Snake venom.

The Bayer Co., Division of Sterling Drug, Inc., Rensselaer, N. Y.—License No. 142.

1. *Trivalent organic arsenicals.*—Acetylglycarsenobenzene; arsphenamine, silver; dichlorophenarsine hydrochloride: neoarsphenamine; sulfarsphenamine.

Wyeth, Inc., Kimberton and Marietta, Pa.—License No. 144:

1. *Antitoxins, therapeutic serums, and analogous products.*—**Antitoxins:** Diphtheria; dysentery, Shiga; B. odematiens; perfringens; scarlet fever streptococcus; V. septique; tetanus. **Therapeutic serums and analogous products:** Anticolon; antidysenteric; antimeningococcic; antipneumococcic; antistreptococcic. Globulin, immune (human); plasma, normal human; serum, normal horse; serum, pneumococcus typing.
2. *Vaccines made from viruses and rickettsiae.*—Rabies (killed virus); Rocky Mountain spotted fever; smallpox; typhus.
3. *Bacterial vaccines made from.*—Acne bacillus; cholera vibrio; colon bacillus; Friedländer bacillus; gonococcus; influenza bacillus; Neisseria catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; pseudodiphtheria bacillus; staphylococcus albus; staphylococcus aureus; streptococcus; typhoid bacillus.
4. *Tuberculin preparations.*—Tuberculin B. E.; tuberculin B. F.; tuberculin old.
5. *Toxins, toxoids, and venoms.*—Diphtheria toxin for Schick test; scarlet fever streptococcus toxin for Dick test; scarlet fever streptococcus toxin for immunization; diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.
6. *Allergenic extracts and analogous products.*—Allergenic extracts (including pollens and miscellaneous substances); poison ivy extract.

Ben Venue Laboratories, Bedford, Ohio.—License No. 146:

Plasma, normal human; serum, normal human.

Endo Products, Inc., Richmond Hill, N. Y.—License No. 147:

Allergenic extracts (including miscellaneous substances).

The Armour Laboratories, Division of Armour and Co., Fort Worth, Tex.—License No. 149:

Albumin, normal serum; fibrin foam; globulin, immune serum (human); thrombin.

E. S. Miller Laboratories, Los Angeles, Calif.—License No. 150:

Bacterial vaccine made from streptococcus.

LICENSED FOREIGN ESTABLISHMENTS

CANADA

Connaught Antitoxin Laboratory, University of Toronto, Toronto, Canada.—License No. 73:

1. *Antitoxins, therapeutic serums, and analogous products.*—Antitoxins: Diphtheria; staphylococcus; tetanus.
2. *Toxins, toxoids, and venoms.*—Diphtheria toxoid; staphylococcus toxoid; tetanus toxoid.

Ayerst, McKenna and Harrison, Ltd., Rouses Point, N. Y., and Montreal, Canada.—License No. 134:

1. *Antitoxins, therapeutic serums, and analogous products.*—Antipertussis serum.
2. *Bacterial vaccines made from.*—Influenza bacillus; micrococcus catarrhalis; paratyphoid bacillus A; paratyphoid bacillus B; pertussis bacillus; pneumococcus; streptococcus; typhoid bacillus.
3. *Bacterial antigen made from.*—Pertussis bacillus.
4. *Toxins, toxoids, and venoms.*—Staphylococcus toxoid.

ENGLAND

Boots Pure Drug Co., Ltd., Nottingham, England.—License No. 92. Selling agent for the United States, the United Drug Co., 43 Leon Street, Boston, Mass.:

Arsphenamine diglucoside.

Wellcome Physiological Research Laboratories, Beckenham, Kent, England.—License No. 129:

Russell viper venom.

SOUTH AMERICA (BRAZIL)

Laboratorio Brasileiro de Chimiotherapia, Rua General Roca No. 28, Rio de Janeiro, Brazil.—License No. 116. Selling agents for the United States and Hawaii, Ernst Bischoff Co., Inc., Ivoryton, Conn. Selling agents for Puerto Rico, Cesar A. Toro, San Juan, P. R.:

fungus extracts.

SICKNESS ABSENTEEISM AMONG INDUSTRIAL WORKERS, SECOND QUARTER OF 1945, WITH AN INQUIRY INTO THE OCCURRENCE OF DIGESTIVE DISEASES, 1936–45[1]

By W. M. Gafafer, *Principal Statistician, United States Public Health Service*

The accompanying data on the frequency of sickness and nonindustrial injuries causing disability for more than one week are derived from analyses of periodic reports from industrial sick benefit associations, group insurance plans, and company relief departments. The group reported upon comprises over 200,000 workers employed in plants located north of the Potomac and east of the Mississippi Rivers.

SECOND QUARTER OF 1945

The morbidity experience of males as shown in table 1 covers the second quarters of 1945 and 1944, the first halves of 1945, 1944, and

Table 1.—*Average annual number of absences per 1,000 males on account of sickness and nonindustrial injuries disabling for 8 consecutive calendar days or longer, by cause, experience of* MALE *employees in various industries, second quarter of 1945 compared with second quarter of 1944, and first half of 1945 compared with first halves of the years 1940–44, inclusive* [1]

Cause. (Numbers in parentheses are disease title numbers from International List of Causes of Death, 1939)	Annual number of absences per 1,000 males				
	Second quarter		First half		
	1945	1944	1945	1944	1940–44
Sickness and nonindustrial injuries	130.8	129.5	151.6	151.1	128.1
Nonindustrial injuries (169–195)	11.2	10.4	13.8	11.2	11.4
Sickness	119.6	119.1	137.8	139.9	116.7
Respiratory diseases	45.2	46.0	60.1	70.6	60.6
Tuberculosis of respiratory system (13)	.6	1.0	.6	.8	.7
Influenza, grippe (33)	14.8	14.8	21.3	34.2	27.8
Bronchitis, acute and chronic (106)	8.1	8.7	11.1	10.1	8.8
Pneumonia, all forms (107–109)	5.2	6.1	6.5	8.7	7.7
Diseases of pharynx and tonsils (115b, 115c)	6.4	6.8	6.8	6.6	6.7
Other respiratory diseases (104, 105, 110–114)	10.1	8.6	13.8	10.2	8.9
Digestive diseases	19.5	19.7	20.2	18.5	16.1
Diseases of stomach except cancer (117, 118)	6.9	5.9	7.3	5.9	4.7
Diarrhea and enteritis (120)	2.5	2.7	2.5	2.4	1.6
Appendicitis (121)	4.2	5.2	4.2	4.7	4.9
Hernia (122a)	2.5	2.1	2.5	1.9	1.9
Other digestive diseases (115a, 115d, 116, 122b–129)	3.4	3.8	3.7	3.6	3.0
Nonrespiratory-nondigestive diseases	48.6	47.9	51.4	45.0	36.6
Infectious and parasitic diseases (1–12, 14–24, 26–29, 31, 32, 34–44) [2]	3.1	3.1	3.4	2.7	2.8
Rheumatism, acute and chronic (58, 59)	7.0	6.5	7.1	6.2	4.8
Neurasthenia and the like (part of 84d)	2.5	2.3	2.5	2.1	1.3
Neuralgia, neuritis, sciatica (87b)	3.7	3.3	3.9	3.1	2.6
Other diseases of nervous system (80–85, 87, except part of 84d, and 87b)	2.0	2.1	2.2	1.9	1.4
Diseases of heart and arteries, and nephritis (90–99, 102, 130–132)	8.4	7.4	8.7	7.5	5.4
Other diseases of genitourinary system (133–138)	3.1	3.6	3.3	3.5	2.8
Diseases of skin (151–153)	3.6	4.0	3.7	3.4	2.8
Diseases of organs of movement except diseases of joints (156b)	3.6	4.3	4.0	3.7	3.3
All other diseases (45–57, 60–79, 88, 89, 100, 101, 103, 154, 155, 156a, 157, 162)	11.6	11.3	12.6	10.9	9.4
Ill-defined and unknown causes (200)	6.3	5.5	6.1	5.8	3.4
Average number of males	212,609	246,514	219,897	251,561	1,194,527

[1] Industrial injuries and venereal diseases are not included.
[2] Exclusive of influenza and grippe, respiratory tuberculosis, and venereal diseases.

[1] From the Industrial Hygiene Division, Bureau of State Services. The report for the first quarter appeared in Public Health Reports, 60: 1043–1049 (Sept. 7, 1945).

the 5 years 1940–44. It will be noted that the average annual number of absences per 1,000 males on account of all sickness and nonindustrial injuries is 130.8 for 1945 as compared with a rate of similar magnitude, 129.5, for the previous year. This similarity of rate extends not only to 1944 but also to 1943 in which year was recorded the highest rate (126.2) of the 10-year period, 1934–43. A relatively high total second-quarter rate has thus been in evidence for 3 years. More notable than differences, where broad and specific causes are concerned, are the similarities between the corresponding second-quarter rates of 1945 and 1944.

FIRST HALF OF 1945

A comparison of corresponding rates for the first halves of 1945 and 1944 reveals a notable decrease in the frequency of influenza and grippe, the relatively high frequency for 1944 reflecting the epidemic prevalent during January of that year. Attention is also directed to the slight increase in the nonrespiratory-nondigestive diseases. The digestive diseases as a group show only a slight increase from 1944 to 1945.

DIGESTIVE DISEASES, FIRST HALVES OF 1936–45

While the digestive disease group presents only a small increase from the first half of 1944 to the first half of 1945, the 1945 rate is relatively high when compared with the average rate, 16.1, for the first halves of the 5 years 1940–44. This raises the question of the behavior of the digestive diseases in a longer period of time, say the 10 years 1936–45. An examination of the appropriate rates reveals a number of notable relationships for the digestive group and for certain specific causes as indicated in table 2.

The average annual number of absences per 1,000 males yielded by the digestive diseases as a group is 15.5 for the 10 years. When the corresponding rates for specific halves are related to the 10-year mean, 1942 is the earliest year to present an excess (4 percent). Excesses are also shown for the subsequent years as follows: 1943, 1 percent; 1944, 19 percent; and 1945, 30 percent. Excesses above the corresponding 10-year mean are also shown by diseases of the stomach except cancer for 1943, 1944, and 1945, the percentage excesses doubling with the passage of the years, and being 13, 28, and 59, respectively. Another digestive cause of interest is diarrhea and enteritis with percentage excesses of 7, 14, 71, and 79, for the 4 years, 1942–45, respectively.

TABLE 2.—*Average annual number of absences per 1,000 males on account of certain digestive diseases disabling for 8 consecutive calendar days or longer in various industries, first halves of 1936–45, inclusive*

Year in first half of which onset of disability occurred	All sickness	Digestive diseases	Diseases of stomach except cancer	Diarrhea and enteritis
	Average annual number of absences per 1,000 males			
1936–45 (mean)	108.4	15.5	4.6	1.4
1936	90.4	14.2	3.9	1.2
1937	106.1	13.7	3.8	1.1
1938	77.6	13.6	4.1	.8
1939	94.7	13.8	3.7	1.1
1940	99.7	15.2	3.9	1.3
1941	104.9	14.5	3.8	1.1
1942	99.1	16.1	4.4	1.5
1943	133.3	15.6	5.2	1.6
1944	139.9	18.5	5.9	2.4
1945	137.8	20.2	7.3	2.5
	Ratio of rate to mean for 1936–45			
1936–45 (mean)	1.00	1.00	1.00	1.00
1936	.83	.92	.85	.86
1937	.98	.88	.83	.79
1938	.72	.88	.89	.57
1939	.87	.89	.80	.79
1940	.92	.98	.85	.93
1941	.97	.94	.83	.79
1942	.91	1.04	.96	1.07
1943	1.23	1.01	1.13	1.14
1944	1.29	1.19	1.28	1.71
1945	1.27	1.30	1.59	1.79

COMMENT

The persistence of relatively high sickness absenteeism rates over over the past 3 or 4 years undoubtedly indicates the precipitation of a number of factors by the extraordinary demands on the productive capacities of industry. These demands introduced multitudinous changes in the working, home, and community conditions. Because of the reduction in available manpower, industry found it necessary to employ youth, the older worker, the long unemployed, the inexperienced, and many persons excluded from the armed forces for some reason or other. Reference is also made to emotional strains and personal mental conflicts, the lowered physical standards for employment, overtime with its attendant fatigue, and night work.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

August 12–September 8, 1945

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State

for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended September 8, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period August 12–September 8, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44*

Geographic section	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,221	871	951	3,070	2,209	2,209	2,422	2,533	3,149
New England	11	21	13	54	11	4	212	228	349
Middle Atlantic	74	38	56	12	21	21	245	346	809
East North Central	81	95	95	66	74	89	612	481	631
West North Central	101	51	80	23	29	35	84	109	184
South Atlantic	373	204	265	945	628	816	73	329	329
East South Central	222	158	152	94	41	69	40	42	115
West South Central	237	171	150	1,730	1,180	986	173	168	168
Mountain	38	60	48	105	159	159	296	94	207
Pacific	84	73	48	41	66	71	687	736	452
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	299	537	187	3,436	5,967	2,376	3,356	2,746	2,740
New England	12	36	16	222	267	110	242	231	231
Middle Atlantic	65	166	55	1,107	3,013	258	539	392	423
East North Central	73	93	19	709	1,062	907	757	621	652
West North Central	17	39	17	267	360	360	305	222	265
South Atlantic	33	54	42	313	801	236	527	449	367
East South Central	29	48	15	153	214	90	229	162	194
West South Central	29	27	11	277	58	58	220	126	113
Mountain	10	10	4	166	55	55	98	138	116
Pacific	31	64	13	222	137	137	439	405	223
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	10	10	16	671	675	887	8,711	6,984	11,056
New England	0	0	0	[3] 60	34	35	712	580	690
Middle Atlantic	0	0	0	93	97	130	2,494	1,088	2,228
East North Central	5	0	7	52	75	102	1,865	1,719	3,260
West North Central	3	3	4	33	49	59	334	543	543
South Atlantic	1	3	2	130	120	188	1,173	1,189	1,297
East South Central	1	3	2	116	72	142	281	307	408
West South Central	0	0	1	114	178	178	725	742	692
Mountain	0	0	0	43	31	40	361	475	475
Pacific	0	1	1	30	19	30	766	341	871

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.
[3] Includes 37 cases reported as *Salmonella* infection in 1 hospital in Massachusetts.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis rose from 1,907 during the 4 weeks ended August 11 to 3,436 during the 4 weeks ended September 8. The current incidence was less than 60 percent of the 1944 figure (5,967 cases) for this period, but it was 1.4 times the 1940–44 median (2,376 cases). Each section of the country except the East North Central and West North Central sections reported an increase

over the normal seasonal expectancy. In the West South Central section the number of cases (277) was 4.8 times the median and in the Middle Atlantic section the number (1,107 cases) was 4.3 times the normal seasonal incidence. Other sections reported minor increases ranging from 1.6 times the median in the Pacific region to 3 times the median in the Mountain region. States reporting more than 100 cases for the 4-week period were: New York 553, Illinois 423, New Jersey 316, Pennsylvania 238, Texas 191, Massachusetts 121, Tennessee 113, California 112, Ohio 111, and Virginia 107 cases—about 70 percent of the total cases occurred in these 10 States.

Table 2 shows the total reported cases since the beginning of the year and the incidence by weeks since the first of July, with corresponding data for 1944 and 1943. While the current rise of this disease first appeared in the West South Central section and spread rapidly into the Atlantic Coast region, practically every section of the country has felt its effect. In recent years the peak of this disease has generally

TABLE 2.—*Number of cases of poliomyelitis reported in each geographic area during 1945, 1944, and 1943* [1]

Division	Total January 1–September 15	Week ended—										
		July				August				September		
		7	14	21	28	4	11	18	25	1	8	15
All regions:												
1945	7,982	154	253	369	391	476	671	692	931	917	896	965
1944	12,458	290	402	568	738	932	1,015	1,260	1,529	1,680	1,498	1,440
1943	7,812	245	297	329	361	450	545	747	872	956	906	1,020
New England:												
1945	497	11	8	26	34	33	53	38	62	63	59	69
1944	446	4	8	9	12	36	37	54	74	75	64	49
1943	485	1	6	3	11	32	36	62	62	77	73	91
Middle Atlantic:												
1945	2,421	31	56	95	120	196	227	232	344	295	236	330
1944	5,361	62	125	216	304	413	449	601	756	895	761	674
1943	506	6	14	12	13	20	38	46	57	72	73	91
East North Central:												
1945	1,213	10	17	19	27	51	113	121	189	177	222	160
1944	2,043	21	58	63	111	143	178	215	271	321	255	329
1943	1,424	8	4	12	21	46	79	144	241	249	273	288
West North Central:												
1945	517	5	7	14	8	15	29	33	49	97	88	122
1944	627	9	8	25	22	28	54	67	104	77	112	76
1943	1,023	9	15	12	40	61	117	118	131	183	138	148
South Atlantic:												
1945	869	23	42	68	55	46	78	76	86	80	70	60
1944	2,094	123	126	128	136	167	167	195	214	205	187	169
1943	153	1	6	9	7	5	8	7	10	8	10	23
East South Central:												
1945	493	25	35	26	42	28	35	47	37	30	39	23
1944	857	37	91	90	101	84	67	53	56	48	57	59
1943	183	6	5	6	14	11	5	29	20	14	12	7
West South Central:												
1945	1,043	30	56	78	58	58	78	79	86	60	52	75
1944	376	17	26	18	22	27	23	16	11	14	17	15
1943	1,605	137	148	148	141	122	119	104	117	81	90	89
Mountain:												
1945	334	1	3	13	16	18	29	17	35	55	59	54
1944	135	6	2	1	4	4	9	12	16	12	15	18
1943	556	2	9	11	4	29	23	43	47	123	93	92
Pacific:												
1945	595	18	29	30	31	31	29	49	43	60	70	72
1944	518	11	18	18	26	30	31	47	27	33	30	51
1943	1,877	75	90	116	110	124	120	194	187	149	144	191

[1] A similar table with earlier data appeared in PUBLIC HEALTH REPORTS of Sept. 7, 1945, p. 1055.

been reached during the latter part of September. Reports indicated that the peak might have been reached during the week ended August 25, when 931 cases were reported, followed by 2 weeks of declining incidence, 917 and 896 cases, respectively. However, later reports (week ended September 15) show a sharp increase over the preceding week in the number of cases in some States in the New England, Middle Atlantic, West North Central, and West South Central sections. The New England, West North Central, and Pacific sections reported the highest weekly incidence in these sections during the week ended September 15.

Diphtheria.—The number of cases of diphtheria rose from 950 during the preceding 4-week period to 1,221 during the 4 weeks ended September 8. The number was 1.4 times that reported for the corresponding period in 1944 and 1.3 times the 1940–44 median. For the country as a whole the current incidence is the highest reported for this period since 1939 when 1,446 cases occurred. Six of the geographic regions reported increases over the 1944 incidence as well as over the 1940–44 median. In the New England section the number of cases was about normal, the East North Central section reported a 15-percent decrease from the 5-year median and the Mountain section reported a 20-percent decline.

Influenza.—The incidence of influenza was somewhat above normal for this season of the year, the number of cases (3,070) reported for the current 4 weeks being 1.4 times the 1940–44 median. The New England, South Atlantic, East South Central, and West South Central sections reported excesses over the median, but in the other 5 sections the incidence was relatively low. Eighty percent of the total cases occurred in 4 States, viz, Texas (1,461) cases, South Carolina (521), Virginia (403), and Louisiana (162). While the number of cases is not large it represents the highest incidence for this period in the 17 years for which these data are available.

Meningococcus meningitis.—For the 4 weeks ended September 8 there were 299 cases of meningococcus meningitis reported, as compared with 537 for the corresponding period in 1944 and a 1940–44 median of 187 cases. In the West South Central and Mountain sections the incidence was about the same as in 1944, but all other sections reported fewer cases than occurred during this period in that year. Compared with the 1940–44 median the number of cases was lower in the New England and South Atlantic sections, the same as the median in the West North Central sections, and higher in the other 6 sections.

Scarlet fever.—There were 3,356 cases of scarlet fever reported for the 4 weeks ended September 8. The 1940–44 median for the corresponding period was 2,740 cases. Each geographic section except the

Mountain reported an increase over the normal seasonal expectancy. For the country as a whole the current incidence is the highest since 1937 when 3,450 cases were reported for the corresponding 4-week period.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—For the 4 weeks ended September 8 there were 2,422 cases of measles reported. The number was slightly below the 1944 figure (2,533 cases) for the corresponding 4 weeks and about 20 percent below the 1940–44 median. The incidence was somewhat above the seasonal expectancy in the Mountain and Pacific sections, about normal in the East North Central and West South Central sections, and considerably below the normal seasonal incidence in all other sections. For the country as a whole the number of cases was the lowest for this period since 1939 when 1,857 cases were reported for these same weeks.

Smallpox.—The number of cases (10) of smallpox reported for the current 4-week period was the same as occurred during the corresponding 4 weeks in 1944. The distribution of cases was, however, slightly different and wherever cases occurred the number was lower than the preceding 5-year median.

Typhoid fever.—The number of cases (671) of this disease was about on a level with the number reported for the corresponding period in 1944, but it was only about 75 percent of the 1940–44 median. The situation was favorable in almost all sections of the country, the incidence either closely approximating the preceding 5-year median or falling considerably below it.

Whooping cough.—For the 4 weeks ended September 8 there were 8,711 cases of whooping cough reported, as compared with 6,984 for the corresponding period in 1944, and a 1940–44 median of approximately 11,000 cases. A few more cases than might normally be expected occurred in the New England, Middle Atlantic, and West South Central sections, but in all other sections the numbers of cases were relatively low.

MORTALITY, ALL CAUSES

For the 4 weeks ended September 8 there were 32,867 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding weeks in 1942–44 was 30,905. For the first week of the period the number of deaths in 1945 was 4.5 percent less than the preceding 3-year average, but the number during each of the other 3 weeks was larger than the average, the increases being 12.6 percent in the first week, 10.3 percent in the third week, and 7.5 percent during the last week of the 4-week period.

OCCUPATIONAL DERMATOSES ABSTRACTS[1]

A Review

Abstracts from the literature on occupational and related dermatoses covering the period January 1940 through June 1943 are contained in Public Health Bulletin No. 284.

The pamphlet contains 179 pages, and comprises materials from many languages. It includes, in alphabetically arranged listing, articles relating to most forms of occupational dermatoses and to a wide variety of causative factors. Extensive sections are devoted to carcinoma, chemicals, cleansers, cosmetics, drug eruptions (including studies on effects of sulfonamides), industrial dermatoses, metals, plants and woods, resins and waxes, textiles, and conditions associated with production and use of military materials such as war chemicals, explosives, and gases. Prevention and sensitivity are covered. Studies in newer burn therapy are included.

This volume is a continuation of Public Health Bulletin No. 266, which contains abstracts from the literature on occupational and related dermatoses from 1935 through 1939. It was prepared by the Dermatoses Section of the Industrial Hygiene Division, Bureau of State Services of the United States Public Health Service, as part of its routine activity.

DEATHS DURING WEEK ENDED SEPTEMBER 8, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 8, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,120	7,673
Average for 3 prior years	7,550	
Total deaths, first 36 weeks of year	325,105	327,682
Deaths under 1 year of age	619	618
Average for 3 prior years	598	
Deaths under 1 year of age, first 36 weeks of year	21,830	22,306
Data from industrial insurance companies:		
Policies in force	67,331,795	66,723,057
Number of death claims	9,486	9,601
Death claims per 1,000 policies in force, annual rate	7.3	7.5
Death claims per 1,000 policies, first 36 weeks of year, annual rate	10.3	10.1

[1] Occupational and related dermatoses. Abstracts from the literature January 1940 to June 1943, inclusive. By Louis Schwartz and Norman R. Goldsmith. Pub. Health Bull. No. 284. Government Printing Office, 1944. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25 cents.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 15, 1945

Summary

Following declines in the past 2 weeks, the incidence of poliomyelitis for the country as a whole again increased—963 cases as compared with 891 for the preceding week, 917 for the week ended September 1, and 931 for the week of August 25, the last figure being the previous weekly high. Declines were reported currently in the East Central, South Atlantic, and Mountain areas.

An aggregate increase of 250 cases occurred in 15 of the 23 States reporting 10 or more cases each, while a decline of 122 cases occurred in the remaining 8 States. A decline of 20 cases was also reported in one other State (Indiana—from 28 to 8). States reporting more than 16 cases each are as follows (last week's figures in parentheses): *Increases*—Massachusetts 45 (30), New York 148 (114), New Jersey 87 (60), Pennsylvania 95 (62), Wisconsin 39 (19), Minnesota 25 (17), Iowa 46 (9), Nebraska 18 (7), Oklahoma 20 (10), Texas 44 (30), California 46 (30); *decreases*—Ohio 30 (33), Illinois 66 (131), Missouri 24 (36), Virginia 19 (30), Utah 22 (23), Washington 25 (33).

A total of 93 cases of meningococcus meningitis was reported as compared with 73 last week and 59 for the next earlier week, which was the lowest weekly incidence recorded so far this year. The total to date is 6,494, as compared with 13,607 for the corresponding period last year, 14,153 for the same period in 1943, and a 5-year median of 2,584.

Of the total of 69 cases of infectious encephalitis, 51 occurred in California, where 161 of the 244 cases reported since the first of July have occurred.

For the current week a total of 8,173 deaths was recorded in 91 large cities of the United States, as compared with 8,068 last week, 7,737 for the corresponding week last year, and a 3-year (1942–44) average of 7,818. The total to date for these cities is 330,517, as compared with 332,323 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended September 15, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 15, 1945	Sept. 16, 1944		Sept. 15, 1945	Sept. 16, 1944		Sept. 15, 1945	Sept. 16, 1944		Sept. 15, 1945	Sept. 16, 1944	
NEW ENGLAND												
Maine	1	0	0	------	------	------	2	0	5	1	0	1
New Hampshire	0	0	0	------	------	------	1	2	0	0	0	0
Vermont	2	0	0	------	------	------	6	0	1	0	1	0
Massachusetts	1	6	2	------	------	------	40	18	31	1	3	3
Rhode Island	0	0	0	11	------	------	3	0	3	0	2	0
Connecticut	0	0	0	1	------	1	0	5	5	1	3	1
MIDDLE ATLANTIC												
New York	10	15	7	[1] 1	([1])	------	23	21	70	9	13	8
New Jersey	4	2	2	1	------	4	18	8	21	2	3	2
Pennsylvania	3	8	7	1	------	------	43	26	26	8	11	3
EAST NORTH CENTRAL												
Ohio	6	11	5	2	2	4	2	5	13	1	6	3
Indiana	5	5	3	------	7	4	5	4	4	2	3	1
Illinois	0	3	13	2	1	1	42	14	15	8	9	3
Michigan [2]	16	9	4	2	1	2	43	9	44	4	9	1
Wisconsin	1	0	0	17	10	16	19	30	61	1	4	1
WEST NORTH CENTRAL												
Minnesota	4	5	4	------	------	------	2	4	4	1	1	0
Iowa	3	0	2	------	------	1	1	2	4	2	0	0
Missouri	4	3	3	1	2	------	4	3	2	4	4	1
North Dakota	2	1	1	------	3	------	1	0	0	0	0	0
South Dakota	7	6	2	------	------	------	2	2	1	3	0	0
Nebraska	4	2	2	------	2	------	0	1	1	0	0	0
Kansas	6	2	3	------	------	1	6	7	5	3	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	0	1	0	0	0
Maryland [2]	7	1	1	------	------	------	1	3	5	0	0	0
District of Columbia	0	0	1	------	------	------	2	0	1	0	0	0
Virginia	18	4	7	123	55	66	1	4	10	3	4	1
West Virginia	14	8	6	------	------	1	0	2	3	4	1	2
North Carolina	53	13	40	------	------	------	1	5	7	0	1	1
South Carolina	17	9	19	89	129	129	12	6	6	1	3	1
Georgia	33	13	21	6	3	7	3	4	1	1	1	0
Florida	5	4	3	1	1	2	1	5	4	1	1	0
EAST SOUTH CENTRAL												
Kentucky	15	8	8	------	1	1	5	0	3	1	0	0
Tennessee	31	6	10	2	5	6	3	2	10	3	2	2
Alabama	30	34	19	28	8	8	0	1	2	1	1	1
Mississippi [2]	18	14	12	------	------	------	------	------	------	2	0	0
WEST SOUTH CENTRAL												
Arkansas	13	4	11	15	24	5	0	3	4	1	1	0
Louisiana	13	6	6	11	2	2	0	0	0	2	0	0
Oklahoma	5	9	8	20	------	8	2	1	1	0	0	0
Texas	54	43	26	517	259	254	31	18	22	8	2	1
MOUNTAIN												
Montana	0	8	0	16	2	------	6	2	3	0	1	0
Idaho	2	0	0	------	5	------	20	0	0	1	0	0
Wyoming	0	0	0	1	------	------	1	1	1	0	0	0
Colorado	4	4	4	2	6	6	7	1	4	0	2	0
New Mexico	2	2	2	------	3	1	1	1	1	0	0	0
Arizona	2	1	1	15	24	34	0	0	3	0	2	1
Utah [2]	0	0	0	25	------	------	20	8	6	0	0	0
Nevada	0	1	0	------	------	------	0	23	0	0	0	0
PACIFIC												
Washington	2	8	3	------	------	------	66	15	13	3	4	1
Oregon	5	2	2	3	1	6	14	11	15	1	8	0
California	24	21	16	10	8	14	101	88	49	9	24	5
Total	446	301	302	923	564	601	561	365	561	93	126	43
37 weeks	9,750	7,752	8,541	74,222	340,887	170,891	103,585	593,079	540,807	6,494	13,607	2,584

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended September 15, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 15, 1945	Sept. 16, 1944		Sept. 15, 1945	Sept. 16, 1944		Sept. 15, 945	Sept. 16, 1944		Sept. 15, 1945	Sept. 16, 1944	
NEW ENGLAND												
Maine	8	1	1	8	13	8	0	0	0	2	0	0
New Hampshire	1	6	0	2	1	1	0	0	0	0	0	0
Vermont	0	2	2	2	4	3	0	0	0	0	0	1
Massachusetts	45	28	16	42	57	59	0	0	0	1	6	6
Rhode Island	0	0	1	3	0	2	0	0	0	1	1	1
Connecticut	15	12	12	12	5	11	0	0	0	3	3	1
MIDDLE ATLANTIC												
New York	148	497	65	87	81	78	0	0	0	6	7	9
New Jersey	87	54	20	25	16	21	0	0	0	6	3	4
Pennsylvania	95	123	18	67	57	57	0	0	0	7	9	20
EAST NORTH CENTRAL												
Ohio	30	118	35	67	50	52	0	1	0	7	7	7
Indiana	8	24	13	15	23	21	0	0	0	6	3	2
Illinois	66	44	52	50	49	49	0	0	0	2	0	9
Michigan[2]	16	112	29	44	38	39	0	0	0	2	3	3
Wisconsin	39	31	18	23	29	37	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	25	40	10	20	22	16	0	0	0	1	0	1
Iowa	46	13	13	13	10	16	0	0	0	2	0	1
Missouri	24	4	4	14	19	18	0	0	0	1	5	5
North Dakota	1	5	2	4	5	4	0	0	0	0	0	0
South Dakota	0	1	1	2	0	4	0	0	0	0	1	0
Nebraska	18	4	11	12	6	7	0	0	0	0	0	0
Kansas	8	9	10	19	18	32	0	0	0	3	6	4
SOUTH ATLANTIC												
Delaware	1	6	0	1	0	4	0	0	0	0	0	0
Maryland[2]	8	54	2	23	16	16	0	0	0	1	5	4
District of Columbia	5	16	2	4	3	4	0	0	0	0	0	1
Virginia	19	46	11	32	24	24	1	1	0	6	3	8
West Virginia	3	10	1	54	48	28	0	0	0	9	6	6
North Carolina	5	28	9	59	34	40	0	0	0	5	3	7
South Carolina	5	0	2	12	4	8	0	0	0	1	6	6
Georgia	2	5	4	13	15	15	0	0	0	7	6	8
Florida	11	4	4	7	4	4	0	0	0	2	1	1
EAST SOUTH CENTRAL												
Kentucky	2	40	14	18	18	25	0	0	0	8	6	13
Tennessee	15	11	4	21	34	28	0	1	1	63	9	10
Alabama	3	5	1	15	23	23	0	0	0	9	4	5
Mississippi[2]	3	3	3	12	11	11	0	0	0	8	8	8
WEST SOUTH CENTRAL												
Arkansas	5	1	2	7	6	4	1	0	0	9	11	11
Louisiana	6	2	2	7	5	2	0	0	0	4	6	12
Oklahoma	20	2	2	10	3	6	0	0	0	6	2	5
Texas	44	10	8	51	10	16	0	0	0	15	13	28
MOUNTAIN												
Montana	10	3	3	1	9	9	0	0	0	0	0	0
Idaho	2	1	1	2	1	3	0	1	0	1	0	0
Wyoming	1	0	0	3	2	1	0	0	0	0	0	0
Colorado	16	7	6	7	12	13	0	0	0	1	1	4
New Mexico	2	2	2	13	3	2	0	0	0	2	2	3
Arizona	1	2	0	0	3	1	0	0	0	1	0	1
Utah[2]	22	2	3	5	6	6	0	0	0	0	0	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	25	14	12	9	13	12	0	0	0	0	2	1
Oregon	1	12	6	9	15	8	0	0	0	1	0	2
California	46	25	14	97	68	55	0	0	0	4	13	10
Total	963	1,440	797	1,023	893	893	2	3	9	208	162	219
37 weeks	8,010	12,412	5,204	138,197	150,581	101,240	277	314	634	3,504	3,924	4,919

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately, as follows: Rhode Island 1; New York 2; New Jersey 2; Ohio 2; North Carolina 1; Georgia 3; Oklahoma 1; Texas 3; California 1.

Telegraphic morbidity reports from State health officers for the week ended September 15, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Sept. 15, 1945	Whooping cough: Week ended— Sept. 16, 1944	Whooping cough: Median 1940–44	Week ended Sept. 15, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	32	16	24	0	0	0	0	0	0	0	3
New Hampshire	0	3	2	0	0	0	0	0	0	0	0
Vermont	22	23	15	0	0	0	0	0	0	0	0
Massachusetts	[6] 170	86	130	0	3	0	0	0	0	0	1
Rhode Island	13	8	23	0	2	0	0	0	0	0	1
Connecticut	36	36	36	0	0	0	1	0	0	0	0
MIDDLE ATLANTIC											
New York	403	168	255	6	30	0	3	0	0	1	5
New Jersey	201	70	150	1	0	2	0	0	0	0	2
Pennsylvania	185	99	216	0	0	0	0	0	1	0	3
EAST NORTH CENTRAL											
Ohio	107	122	147	0	0	0	1	0	0	0	0
Indiana	20	10	25	1	1	2	2	0	0	0	1
Illinois	117	104	139	4	0	0	0	0	0	0	11
Michigan [2]	172	114	256	0	1	0	0	0	0	0	1
Wisconsin	61	126	204	0	0	0	0	0	1	0	9
WEST NORTH CENTRAL											
Minnesota	20	37	55	1	0	0	0	0	0	0	4
Iowa	9	7	11	0	0	0	3	0	0	0	9
Missouri	17	10	18	0	0	0	0	0	0	0	0
North Dakota	4	10	5	0	0	0	0	0	0	0	0
South Dakota	5	13	11	0	0	0	0	0	0	0	0
Nebraska	0	1	2	0	0	0	0	0	0	0	0
Kansas	38	23	33	1	0	0	2	0	0	0	12
SOUTH ATLANTIC											
Delaware	3	3	2	0	0	0	0	0	0	0	0
Maryland [2]	42	66	65	0	0	9	0	1	0	0	1
District of Columbia	6	2	14	0	0	0	0	0	0	0	0
Virginia	48	22	47	0	0	338	0	2	0	0	1
West Virginia	5	18	31	0	0	0	0	0	0	0	0
North Carolina	73	73	77	0	0	0	0	4	0	1	0
South Carolina	84	65	65	2	26	0	0	0	1	8	0
Georgia	19	17	9	0	3	1	0	0	0	47	5
Florida	5	2	5	1	0	0	0	0	1	8	0
EAST SOUTH CENTRAL											
Kentucky	18	40	63	0	2	0	0	0	0	0	0
Tennessee	22	36	36	1	0	0	1	0	3	2	2
Alabama	20	22	22	2	0	0	0	0	0	28	1
Mississippi [2]	-----	-----	-----	0	0	0	0	0	1	19	11
WEST SOUTH CENTRAL											
Arkansas	4	28	18	3	20	0	0	0	1	0	0
Louisiana	7	2	2	0	30	0	0	1	1	14	0
Oklahoma	17	1	6	0	7	2	3	1	0	0	0
Texas	135	86	96	9	613	15	0	0	0	45	11
MOUNTAIN											
Montana	1	38	34	0	0	0	0	0	0	0	0
Idaho	10	1	4	0	0	0	0	0	0	0	0
Wyoming	3	5	13	0	0	0	0	1	2	0	1
Colorado	38	62	17	0	0	0	2	0	0	0	0
New Mexico	8	4	6	1	6	0	0	0	0	0	0
Arizona	3	10	10	0	0	22	0	0	0	0	0
Utah [2]	4	4	22	0	0	0	0	0	2	0	0
Nevada	0	1	1	0	0	0	0	0	0	0	0
PACIFIC											
Washington	27	36	53	0	0	0	0	0	0	0	2
Oregon	15	13	15	0	0	0	0	0	0	0	4
California	114	106	187	4	4	0	51	0	0	1	3
Total	2,363	1,849	2,772	37	748	391	69	10	14	174	104
Same week 1944	1,849	-----	-----	36	474	295	13	9	11	179	75
Average, 1942–44	2,541	-----	-----	36	378	229	20	[5] 11	10	[5] 136	-----
37 weeks: 1945	[6] 93,369	-----	-----	1,353	18,768	7,945	424	414	564	[6] 3,356	3,434
1944	70,150	-----	-----	1,245	16,095	6,321	472	416	419	3,441	2,597
Average, 1942–44	115,612	-----	[5] 133,994	1,200	11,549	5,747	466	[5] 416	586	[5] 2,365	-----

[2] Period ended earlier than Saturday.
[5] 5-year median, 1940–44.
[6] Delayed reports: Typhus fever, week ended Sept. 1, Arkansas 1 case (instead of 0); whooping cough, week ended Sept. 8, Massachusetts 146 cases (instead of 0).

Leprosy: California 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 8, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	1	0	2	4	0	0	3
New Hampshire:												
Concord	0	0	------	0	0	0	2	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	2	0	------	0	2	0	6	22	9	0	0	24
Fall River	0	0	------	0	0	0	0	0	3	0	0	0
Springfield	0	0	------	0	0	0	0	1	1	0	0	6
Worcester	0	0	------	0	5	0	3	2	0	0	0	8
Rhode Island:												
Providence	0	0	1	0	0	1	3	0	0	0	0	19
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	1	0	0	0
Hartford	0	0	------	0	1	0	1	2	0	0	0	3
New Haven	0	0	------	0	0	0	0	1	0	0	0	10
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	1	0	1	4	4	0	0	7
New York	8	1	2	1	1	3	53	47	18	0	7	107
Rochester	0	0	------	0	1	1	1	11	0	0	1	10
Syracuse	0	0	------	0	0	0	3	0	6	0	0	28
New Jersey:												
Camden	0	0	------	0	2	0	0	2	0	0	0	5
Newark	0	0	1	0	0	1	3	1	4	0	0	17
Trenton	0	0	------	0	0	1	1	2	0	0	0	2
Pennsylvania:												
Philadelphia	0	0	1	1	18	2	14	18	6	0	1	58
Pittsburgh	1	0	------	1	0	2	5	8	6	0	1	9
Reading	0	0	------	0	1	0	2	0	1	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	2	0	0	7	2	1	0	0	8
Cleveland	0	0	2	0	0	1	3	4	7	0	0	37
Columbus	0	0	------	0	0	0	3	1	3	0	0	1
Indiana:												
Fort Wayne	0	0	------	0	2	1	0	0	0	0	0	0
Indianapolis	2	0	------	0	0	0	3	1	2	0	0	7
South Bend	0	0	------	0	2	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	1	1
Illinois:												
Chicago	0	0	2	1	17	1	21	17	15	0	0	53
Springfield	0	0	------	0	0	0	2	0	0	0	0	5
Michigan:												
Detroit	10	0	------	0	14	2	9	2	10	0	0	102
Flint	0	0	------	0	0	0	1	0	1	0	0	1
Grand Rapids	0	0	------	0	0	0	0	0	1	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	3	0	0	10	10	0	0	4
Racine	0	0	------	0	0	0	0	0	1	0	0	0
Superior	0	0	------	0	1	0	1	0	0	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	1	0	0	5	0	0	0	0
Minneapolis	0	0	------	0	1	0	5	6	6	0	0	13
Missouri:												
Kansas City	0	0	------	1	3	0	6	0	1	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	1	0	0	0
St. Louis	0	0	------	0	1	0	6	7	6	0	1	4

City reports for week ended September 8, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	3	0	------	0	0	0	0	2	0	0	0	2
Nebraska:												
Omaha	0	0	------	0	2	0	6	4	0	0	0	0
Kansas:												
Topeka	0	0	------	0	0	0	1	0	0	0	0	4
Wichita	0	0	------	0	0	0	3	0	1	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	3	0	1	0	0	0
Maryland:												
Baltimore	11	0	1	1	5	0	5	0	7	0	0	27
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	0	2	4	3	0	0	7
Virginia:												
Lynchburg	0	0	------	0	0	0	1	1	1	0	0	6
Richmond	0	0	------	0	0	0	0	20	7	0	1	2
Roanoke	0	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	0	0	0	0
Wheeling	0	0	------	0	0	1	0	0	1	0	1	0
North Carolina:												
Raleigh	0	0	------	0	0	0	2	0	0	0	0	0
Wilmington	1	0	------	0	0	0	0	0	1	0	0	6
Winston-Salem	0	0	------	0	0	0	0	0	4	0	0	4
South Carolina:												
Charleston	1	0	------	0	0	0	0	1	1	0	0	0
Georgia:												
Atlanta	3	0	------	0	0	0	3	0	3	0	0	0
Savannah	0	0	------	0	0	1	0	0	0	0	0	0
Florida:												
Tampa	3	0	------	0	0	0	7	0	2	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	0	2	4	4	0	1	5
Nashville	0	0	------	0	0	0	1	1	1	0	0	0
Alabama:												
Birmingham	0	0	1	0	0	0	3	0	0	0	0	1
Mobile	1	0	------	0	0	1	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	0	0	0	0
Louisiana:												
New Orleans	1	0	1	0	0	1	13	6	3	0	0	3
Shreveport	2	0	------	0	0	0	3	3	0	0	0	0
Texas:												
Dallas	1	0	------	0	2	0	4	1	1	0	0	0
Galveston	0	0	------	0	0	0	1	0	0	0	0	0
Houston	3	0	------	0	0	0	0	2	3	0	1	0
San Antonio	2	0	------	0	1	0	1	1	2	0	0	3
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	1	0	0	1	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	0	0	1	0	0	0	6	9	3	0	0	12
Pueblo	0	0	------	0	0	0	0	1	0	0	0	6
Utah:												
Salt Lake City	0	0	------	0	3	0	1	3	1	0	0	2

City reports for week ended September 8, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	3	0		0	6	0	5	3	1	0	0	10
Spokane	0	0	1	0	0	0	1	0	0	0	0	1
Tacoma	0	0		0	13	0	2	0	0	0	0	1
California:												
Los Angeles	3	0	9	0	6	1	1	8	17	0	0	24
Sacramento	0	0		0	4	0	0	0	2	0	0	7
San Francisco	1	0		0	11	0	7	3	5	0	1	8
Total	62	1	23	8	130	22	251	256	204	0	18	707
Corresponding week, 1944	47		16	2	101		191		196	0	38	485
Average, 1940-44	48		29	[1] 8	[2] 154		[1] 216		225	0	38	923

[1] 3-year average, 1940-42.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York 2; Chicago 2; St. Joseph 1.
Dysentery, bacillary.—Cases: New York 6; Chicago 1; St Louis 1; Charleston, S. C., 7; Nashville 1.
Dysentery, unspecified.—Cases: Baltimore 2; Richmond 4; San Antonio 5.
Typhus fever, endemic.—Cases: Charleston, S. C., 1; Atlanta 1; Savannah 4; Birmingham 2; Mobile 1; New Orleans 5; Dallas 1; Houston 2; San Antonio 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,086,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	2.6	0.0	21	5.2	39.2	78.4	50	0.0	0.0	191
Middle Atlantic	4.2	0.5	1.9	1.4	11	4.6	38.4	43.0	21	0.0	4.6	113
East North Central	7.3	0.0	2.4	1.8	24	3.0	30.4	22.5	31	0.0	0.6	136
West North Central	6.7	0.0	0.0	2.2	18	0.0	60.1	53.4	33	0.0	2.2	69
South Atlantic	31.3	0.0	1.6	1.6	8	3.3	37.9	42.9	51	0.0	3.3	86
East South Central	5.9	0.0	5.9	0.0	0	5.9	41.3	29.5	30	0.0	5.9	35
West South Central	25.8	0.0	2.9	0.0	9	2.9	66.0	37.3	26	0.0	2.9	17
Mountain	0.0	0.0	7.9	0.0	24	0.0	55.6	111.2	32	0.0	7.9	159
Pacific	11.1	0.0	15.8	0.0	63	1.6	25.3	22.1	40	0.0	1.6	81
Total	9.5	0.2	3.5	1.2	20	3.4	38.5	39.3	31	0.0	2.8	108

PLAGUE INFECTION IN ALPINE AND KERN COUNTIES, CALIF.

Plague infection has been reported proved in specimens collected in Alpine County, Calif., as follows: Tissue from 1 ground squirrel, *C. beldingi*, shot at Hope Valley, 6 miles west of Woodfords, on Carson Pass Highway No. 88, proved positive on August 16; tissue from 2 ground squirrels, same species, shot at the same location, proved August 21; tissue from 1 ground squirrel, same species, shot at Kit Carson Public Camp, 4 miles west of Woodfords on Highway No. 89, proved September 6; a pool of 24 fleas from 2 golden

mantled ground squirrels, shot at Mono National Forest, Crystal Springs, Public Camp Grounds, 1 mile west of Woodfords, proved September 6.

Plague infection has been reported proved in specimens of fleas, lice, and tissue from ground squirrels, *C. beecheyi*, collected in Kern County, Calif., as follows: a pool of 200 fleas from 34 ground squirrels shot on the east side of Castair Lake and proved positive August 21, and 2 additional pools of 200 fleas each from the same 34 ground squirrels proved August 27 and August 30, respectively; a pool of 215 fleas from 14 ground squirrels shot 1 mile south of Lebec and proved August 22; a pool of 50 lice from 42 ground squirrels shot 2 miles east and 2 to 4 miles north of Lebec, proved August 30, and tissue from 1 ground squirrel shot at the same location, proved August 27; a pool of 200 fleas from 34 ground squirrels proved August 30, shot 2½ miles west and 1 mile south of Cummings Valley School, and a pool of 200 fleas from 53 ground squirrels proved September 6, shot 2½ miles south and 3 miles west of the same school.

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—July 1945.—During the month of July 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	3		1						4	
Diphtheria	1		1				11		13	
Dysentery:										
Amebic	3		1		2		8		14	
Bacillary	1		1		1		1		4	
Leprosy				1			1		1	1
Malaria [1]	4		2		50		62	1	118	1
Measles			2						2	
Mumps			1		11		3		15	
Paratyphoid fever	1	1	1		2				4	1
Pneumonia		9		4	34			7	[2] 34	20
Relapsing fever							3		3	
Tuberculosis		26		4	6	1		12	[2] 6	43
Typhoid fever							3		3	
Whooping cough					4				[2] 4	

[1] 22 recurrent cases.
[2] In the Canal Zone only.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended August 25, 1945.—During the week ended August 25, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		20	38	2	29	29	14	133
Diphtheria		4	1	26		6				37
Dysentery, bacillary				4	1				5	10
Encephalitis, infectious						2				2
German measles				1	3		1		3	8
Influenza		10			14	1				25
Measles				16	46	1	23	11	7	104
Meningitis, meningococcus				1	2			1	1	5
Mumps		1		6	12	6	2	18		45
Poliomyelitis				5	[1] 11		1		1	[1] 18
Scarlet fever	6	1	12	30	25	7	2	8	4	95
Tuberculosis (all forms)		9	3	92	69	18	1	3	93	288
Typhoid and paratyphoid fever			2	12	2	1		3	5	25
Undulant fever					2			1	1	4
Venereal diseases:										
Gonorrhea	1	27	17	80	184	50	36	38	76	509
Syphilis		6		83	95	17	4	9	31	245
Whooping cough		4	1	134	53	4		12	3	211

[1] Includes 1 case, delayed report.

CHINA

Notifiable diseases—May 1945.—During the month of May 1945, certain notifiable diseases have been reported by the Army Medical Administration, Health Department of the Board of Supplies and Transport, The Chinese Red Cross Medical Corps, and the National Health Administration of China, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	156	10	Relapsing fever	1,178	20
Cholera	19		Scarlet fever	11	
Diphtheria	32	2	Smallpox	448	23
Dysentery	1,571	15	Typhoid fever	449	29
Plague	27	7	Typhus fever	471	32

FINLAND

Notifiable diseases—July 1945.—During the month of July 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	11	Paratyphoid fever	216
Chickenpox	324	Pneumonia (all forms)	847
Conjunctivitis	25	Poliomyelitis	51
Diphtheria	1,072	Puerperal fever	30
Dysentery, unspecified	42	Rheumatic fever	287
Gastroenteritis	7,191	Scabies	1,761
Gonorrhea	2,045	Scarlet fever	160
Hepatitis, epidemic	467	Syphilis	350
Influenza	264	Tetanus	3
Laryngitis	19	Typhoid fever	19
Malaria	190	Vincent's angina	42
Measles	29	Whooping cough	1,748
Mumps	214		

JAMAICA

Notifiable diseases—4 weeks ended August 25, 1945.—During the 4 weeks ended August 25, 1945, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chickenpox	4	10	Puerperal fever		1
Diphtheria	4	7	Scarlet fever		1
Dysentery, unspecified	3	6	Tuberculosis, pulmonary	36	69
Erysipelas	1	8	Typhoid fever	8	118
Leprosy	1	5	Typhus fever (murine)	7	4
Poliomyelitis		1			

NEW ZEALAND

Notifiable diseases—4 weeks ended August 11, 1945.—During the 4 weeks ended August 11, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Malaria	16	
Cerebrospinal meningitis	17	3	Poliomyelitis	1	1
Diphtheria	108	8	Puerperal fever	10	1
Dysentery:			Scarlet fever	500	1
Amebic	3		Tuberculosis (all forms)	240	59
Bacillary	9	1	Typhoid fever	5	
Erysipelas	25		Undulant fever	3	1
Influenza	1				

SWEDEN

Notifiable diseases—June 1945.—During the month of June 1945, cases of certain notifiable diseases were reported in Sweden as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	7	Scarlet fever	1,131
Diphtheria	118	Syphilis	129
Dysentery	14	Typhoid fever	19
Gonorrhea	1,221	Typhus fever	26
Hepatitis	424	Undulant fever	3
Paratyphoid fever	55	Weil's disease	5
Poliomyelitis	54		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports o yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

China.—On August 28, 1945, cholera was reported present in the following provinces of China: Chekiang, Honan, Hunan, Hupeh, Kansu, Kwangsi, Kwangtung, Kweichow, Shensi, Sikong, Szechwan, and Yunnan.

Plague

Great Britain—Malta.—For the week ended September 1, 1945, 4 cases of plague were reported in Malta, Great Britain.

Italy—Taranto.—During the week ended September 15, 1945, 12 cases of plague with 4 deaths were reported in Taranto, Italy. These are believed to be the first cases of plague reported in Italy since 1929, when cases were reported in the Province of Naples, where the infection was thought to have been introduced in shipments of grain from South America.

Morocco (French)—Chaouia Region.—For the period August 21–31, 1945, 15 cases of plague were reported in Chaouia Region, French Morocco.

Smallpox

Bolivia.—For the month of August 1945, 235 cases of smallpox with 32 deaths were reported in Bolivia. Departments reporting the highest incidence are as follows: La Paz, 65 cases, 12 deaths; Cochabamba, 56 cases, 10 deaths; Beni, 52 cases, 5 deaths; Tarija, 30 cases, 4 deaths.

Morocco (French).—For the period August 21–31, 1945, 94 cases of smallpox were reported in French Morocco, including 26 cases in the region of Fez and 56 cases in Marrakech region.

Typhus Fever

Bolivia.—For the month of August 1945, 93 cases of typhus fever with 33 deaths were reported in Bolivia. Departments reporting the highest incidence are as follows: La Paz, 37 cases, 17 deaths; Potosi, 26 cases, 9 deaths; Cochabamba, 18 cases, 5 deaths; Oruro, 12 cases, 2 deaths.

Egypt.—Typhus fever has been reported in Egypt as follows: Weeks ended—August 11, 1945, 90 cases, including 1 case in Ismailiya; August 18, 1945, 10 cases; September 1, 1945, 8 cases, including 2 cases in Port Said.

Guatemala.—For the month of July 1945, 363 cases of typhus fever with 35 deaths were reported in Guatemala.

Morocco (French).—For the period August 21–31, 1945, 141 cases of typhus fever, including 69 cases in the region of Casablanca, 3 cases in the port of Casablanca, and 30 cases in Marrakech region, were reported in French Morocco.

Yellow Fever

Belgian Congo—Irebu.—On September 11, 1945, 1 case of suspected yellow fever was reported in Irebu, Coquithatville Province, Belgian Congo.

ACTIVITIES OF INDUSTRIAL NURSES AND RECOMMENDED STANDARDS FOR NURSING IN INDUSTRY[1]

A Review

Findings of a Nation-wide survey of the work of industrial nurses, and recommendations for acceptable practices in this field, are presented in "Nursing Practices in Industry," Public Health Bulletin No. 283.

The survey analyzed in this bulletin was conducted in 1942, as a joint activity of a committee sponsored by the Public Health Nursing Section of the American Public Health Association and the Industrial Hygiene Division of the United States Public Health Service. Its

[1] Nursing practices in industry. By Olive M. Whitlock, Victoria M. Trasko, and F. Ruth Kahl. Pub- Health Bull. No. 283. Government Printing Office, 1944. For sale by the Superintendent of Documents. Washington 25, D. C. Price 5 cents.

purpose was to obtain factual information on the activities of industrial nurses, and upon this basis to determine the range of nursing activities, define current problems in this field, and formulate standards of good practice for nurses employed by industry.

An analysis is made of the activities of 3,027 full-time nurses serving approximately 2,400,000 workers in 868 industrial plants. The survey included also 22 plants where nurses were employed part time and 34 plants in which some form of health or first-aid service was carried on by nonprofessional workers.

Wartime production demands were found to have increased greatly the number of nurses employed in industrial establishments, with wide diversity existing as to the duties carried on by such nurses. In all plants, their chief functions consisted of nursing treatment and care of occupational injuries and illnesses and emergency care of nonoccupational illnesses, together with routine duties relating to the organization and maintenance of the medical department.

Other activities, and the extent of the nurses' participation in them, were: aiding in the medical examination program in 50 percent of the plants; assistance with accident control and safety education program in 42 percent of the plants; participation in health education program in 15 percent of the plants; assistance with environmental sanitation in 39 percent of the plants; participation in the plant welfare program, chiefly through advice to workers on personal and family problems, in 75 percent of the plants; and home nursing service in 25 percent of the plants.

As a result of the analysis, certain problems and needs in industrial nursing became evident. These included standards in nursing practices, professional preparation of industrial nurses for their duties, written standing orders, nursing supervision, the use of records and reports, the practice of using nurses for nonnursing duties, and the use of nonprofessional attendants in industry.

The lack of standards in nursing practices in industry and the lack of standing orders should no longer be major problems in industrial nursing. As a result of this survey, recommendations for acceptable practices in industrial nursing were made by the Advisory Group of the American Public Health Association's Committee to Study the Duties of Nurses in Industry. These are presented in the bulletin. Recommended qualifications for industrial nurses, suggested record and report forms, and reference materials are also included in the bulletin.

EXPERIMENTAL STUDIES ON THE TOXICITY AND POTENTIAL DANGERS OF TRINITROTOLUENE (TNT)[1]

A Review

Methods were developed for the determination of 2,4,6-trinitrotoluene, 2,6-dinitro-4-aminotoluene, and 2,6-dinitro-4-hydroxylaminotoluene, and the urinary excretion of these substances was studied. Attempts to produce TNT poisoning in dogs by inhalation of its vapors were unsuccessful because a sufficiently high concentration could not be produced. Daily intratracheal insufflation of 25 to 50 mg./kg. TNT caused salivation, vomiting, diarrhea with tenesmus, and spasms of the sphincter of the urinary bladder. The animals showed signs of weakness and incoordination and a temporary anemia, but no significant changes of the blood picture nor definite signs of liver injury. The daily oral administration of 50 mg./kg. caused a train of symptoms arising from the central nervous system, irritation of the gastrointestinal tract, temporary anemia, but no definite liver injury. The spectrophotometric examination of the blood gave no evidence of the presence of other chromogenic substances. There was a moderate methemoglobinemia, associated with the appearance of Heinz's bodies in the red blood cells. Daily administration of 150 mg. of ascorbic acid over a period of 12 weeks did not change the toxicological picture materially, whereas the addition of milk to a balanced basic diet caused a moderate alleviation of the gastrointestinal symptoms, presumably by its demulcent action. Experiments with guinea pigs fed doses of 400 mg./kg. TNT showed that animals on a scorbutogenic diet were more susceptible to TNT than normal animals, but that the addition of an excess of ascorbic acid did not increase the resistance of the animals to the toxic effects of TNT.

The experiments show that TNT is readily absorbed through the lungs when inhaled as dust, from the intestinal tract when ingested, and in small quantities through the intact skin when in intimate contact.

[1] Experimental studies on the toxicity and potential dangers of trinitrotoluene (TNT), by W. F. von Oettingen, D. D. Donahue, R. K. Snyder, B. L. Horecker, A. R. Monaco, A. H. Lawton, T. R. Sweeney, and P. A. Neal. Pub. Health Bull. No. 285. Government Printing Office, 1944. For sale by the Superintendent of Documents, Washington 25, D. C. Price 15 cents.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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PREVALENCE OF DISEASE

// Public Health Reports

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ANEMIA AND GRANULOCYTOPENIA IN RATS FED A DIET LOW IN PANTOTHENIC ACID [1]

By FLOYD S. DAFT, *Principal Biochemist*, ARTHUR KORNBERG, *Passed Assistant Surgeon*, L. L. ASHBURN, *Surgeon*, and W. H. SEBRELL, *Medical Director*, *United States Public Health Service*, with the technical assistance of HOWARD BAKERMAN, *Laboratory Technician* [2]

Spicer, Daft, Sebrell, and Ashburn (*1*) reported the development of agranulocytosis or granulocytopenia, bone-marrow hypoplasia, and an occasional anemia in rats given sulfaguanidine or sulfasuxidine (succinyl sulfathiazole) in purified diets. Anemic and granulocytopenic animals were treated successfully with whole dried liver or with certain liver extracts which were known to contain the *L. casei* factor ("folic acid;" "vitamin B_c"). Confirmatory results have been presented by other investigators (*2, 3*). Kornberg, Daft, and Sebrell (*4*) described similar blood findings, with a greater incidence of anemia, in rats given sulfadiazine or sulfathiazole. Extracts prepared from liver were again found to be effective in curative experiments. Following the isolation of vitamin B_c by Pfiffner et al. (*5*) and the *L. casei* factor by Stokstad and co-workers (*6, 7*), Daft and Sebrell (*8*) announced the successful use of these crystalline materials in the treatment of sulfonamide-induced blood dyscrasias. Kornberg, Daft, and Sebrell (*9*) noted the development of granulocytopenia in a small percentage of rats given a purified diet without sulfonamide. Treatment with *L. casei* factor corrected this dyscrasia.

We wish to report at this time that a deficiency of pantothenic acid in rats may result in anemia, granulocytopenia, and bone-marrow hypoplasia. In the present series of experiments a large proportion of the deficient animals developed dyscrasias, while the control rats receiving adequate pantothenic acid showed almost no deficiency signs. Despite the manifest effectiveness of pantothenic acid in

[1] From the Division of Physiology and the Pathology Laboratory, National Institute of Health.

[2] A preliminary report on this work was presented by the senior author at the Vitamin Conference, Gibson Island, Md., July 25, 1944.

preventive experiments the results of therapeutic tests indicated that the blood and bone-marrow changes were not manifestations of an uncomplicated deficiency of this vitamin.

DEVELOPMENT OF DYSCRASIAS

Albino rats of the Osborne and Mendel or Wistar strain at weaning or within a week thereafter were placed on one of two similar pantothenic acid-deficient diets. Diet No. 939 consisted of leached and alcohol-extracted casein, 18 percent; Crisco, 8 percent; salt mixture No. 550 (*1*), 4 percent; dextrose (Merck U. S. P.), 69.8 percent; $FeSO_4.7H_2O$, 0.18 percent; and $CuSO_4.5H_2O$, 0.02 percent. Into each 100 gm. of this diet were incorporated 1 mg. of thiamine hydrochloride, 2 mg. of riboflavin, 1 mg. pyridoxine hydrochloride, 2 mg. of niacin, 400 micrograms of vitamin K,[3] 1 microgram of biotin, and 200 mg. of choline chloride. Diet No. 966 differed only in that the niacin, vitamin K, and biotin were omitted. Each rat received a supplement twice weekly of 0.25 cc. of corn oil containing 2,000 units of vitamin A and 200 units of vitamin D (Natola). The rats on diet No. 939 each received in addition a weekly supplement of 3 mg. of α-tocopherol in ethyl laurate.

In some of the litters, one rat was given an additional daily oral supplement of 200 micrograms of pantothenic acid. These animals served as controls. A few rats to be discussed under "Treatment of Dyscrasias" were given pantothenic acid at a level of 2 or 5 micrograms per day or *L. casei* factor [4] at a level of 2 or 20 micrograms per day.

At various times, total white cell counts, polymorphonuclear granulocyte counts, hematocrit determinations, and occasionally total red cell counts and hemoglobin determinations were made on the tail blood of these animals. Hemoglobin was determined by the oxyhemoglobin method of Sanford et al. (*10*) and hematocrits with the Van Allen microhematocrit tube using 1.3 percent sodium oxalate. Polymorphonuclear granulocyte counts were made directly in the counting chamber under a high dry lens (×300). The accuracy of this method was established by numerous checks against differential white cell counts made on smears stained with Wright's stain.

For the purpose of this report we shall use the term "blood dyscrasia" to denote a granulocytopenia or an anemia or both combined; we shall use the term "granulocytopenia" to indicate a total polymorphonuclear granulocyte count of not more than 400 cells per cubic millimeter; and we shall use the term "anemia" to indicate hematocrit values of 35 volumes percent or less. These definitions of granulo-

[3] 2-methyl-1, 4-naphthohydroquinone diacetate.

[4] Fermentation product supplied through the courtesy of Dr. E. L. R. Stokstad and Dr. B. L. Hutchings, of Lederle Laboratories, Inc., Pearl River, N. Y.

cytopenia and anemia are admittedly arbitrary. They were adopted primarily to serve as a basis for selection of animals for treatment.

Some phases of our study of the occurrence of anemia and granulocytopenia in rats on pantothenic acid-deficient diets and of the treatment of these dyscrasias are not as yet concluded. In order to indicate with some degree of accuracy the incidence of the blood changes, we will discuss in this section only completed experiments; i. e., experiments in which all of the deficient animals have developed a dyscrasia or have died. The results to be presented were obtained with 40 groups of rats, each group consisting of litter mates of the same sex. There was a total of 92 rats on which counts were obtained; 69 of the 92 were pantothenic acid-deficient and the other 23 were control animals given supplementary pantothenic acid at a level of 200 micrograms per rat per day.

Of the 92 rats to be considered, 57 (41 deficient animals and 16 controls) received diet No. 939, and 35 (28 deficient animals and 7 controls) received diet No. 966. No significant differences were noted between the groups given these two similar diets and the results obtained therefore have been combined and will be considered together.

The results of the blood counts on control animals are recorded in table 1. In most instances only a single count was made. It cannot be said, therefore, that these represent the lowest counts which might have been obtained on the individual animals. Obvious signs which might be attributed to a dietary deficiency, however, such as loss of weight, developed in only one animal of the series, No. 1 in table 1. This rat had difficulty in eating because of a dental defect, which may account for the loss of weight. It developed a moderate leucopenia and a mild transient anemia. For only one other animal in this group, No. 2, was there observed a total leucocyte count below 10,000 cells per cubic millimeter, a total polymorphonuclear count below 1,000 cells per cubic millimeter, or a hematocrit of less than 39 volumes percent.

Results of blood counts on the 69 pantothenic acid-deficient rats are given in table 2. Only the lowest count obtained on each animal is recorded. Twenty of the 69 rats were both granulocytopenic and anemic; 1 was granulocytopenic only; 27 were anemic only; 21 showed neither dyscrasia. In this particular series, therefore, the incidence of the anemia was much greater than that of the granulocytopenia. In other groups of rats, however, the preponderance of anemia over granulocytopenia was not as great. In a recent incomplete study, for example, we have observed 23 cases of anemia alone, 14 of granulocytopenia alone, and 15 of both together. It is worthy of note that the most severe anemsia have occurred in animals which were also granulocytopenic.

TABLE 1.—*Blood counts on rats given adequate pantothenic acid*

Rat No.	Days on experiment	Total white blood cells per cu. mm.	Polymorphonuclear granulocytes per cu. mm.	Hematocrit volume percent
1	98	13,000	2,000	39.8
	105	4,800	1,200	35.5
	113	7,450	1,150	36.1
	139	5,200	3,700	49.4
2	118	6,750	850	39.9
3	63	15,400	3,100	42.1
4	70	21,100	1,700	42.6
5	107	13,550	2,300	43.2
6	53	15,100	2,200	43.5
7	113	16,850	3,250	43.5
8	27	14,600	2,600	39.2
	98	22,350	1,800	43.7
9	53	16,550	1,100	45.2
10	130	13,100	3,250	45.2
11	99	17,300	3,100	45.4
12	68	11,900	2,800	45.8
13	76	10,850	1,600	46.2
14	130	18,800	5,400	46.4
15	85	12,250	2,450	46.5
16	159	14,100	2,000	46.7
17	63	13,600	1,200	47.1
18	99	16,600	1,650	47.4
19	85	30,000	2,700	47.7
20	33	16,950	1,500	44.1
	104	20,250	1,600	47.9
21	104	10,550	1,500	50.2
22	110	14,550	1,400	51.0
23	186	11,650	1,000	51.4

TABLE 2.—*Blood counts on rats fed a diet deficient in pantothenic acid*

Rat No.	Days on experiment	Total white blood cells per cu. mm.	Polymorphonuclear granulocytes per cu. mm.	Hematocrit volume percent [1]
Rats with granulocytopenia and anemia combined				
24	54	2,500	50	6.0
25	39	1,600	50	6.1
26	39	1,350	0	6.8
27	56	1,400	100	9.9
28	53	1,450	100	10.3
29	28	2.150	100	10.4
30	49	600	50	14.6
31	52	1,750	250	14.7
32	26	1,950	150	16.8
33	41	2,000	0	17.7
34	50	1,600	150	19.0
35	53	1,500	0	23.7
36	42	900	0	25.0
37	39	2,750	0	25.0
38	47	2,050	150	25.1
39	64	950	150	27.1
40	23	250	0	29.5
41	60	900	150	31.7
42	53	2,400	400	31.9
43	47	1,200	400	33.1

[1] The hemoglobin values and red blood cell counts which were obtained are as follows:

Rat number	Hemoglobin in grams per 100 cc.	Total red blood cells millions per cu. mm.	Rat number	Hemoglobin in grams per 100 cc.	Total red blood cells millions per cu. mm.
26	3.0	1.2	49	5.8	3.0
27	4.7	1.9	50	9.8	4.5
31	6.9	2.9	51	6.6	3.3
33	6.6	3.4	55	10.9	6.4
36	10.6	5.0	57	8.2	4.2
38	9.2	4.8	58	11.0	5.0
41	10.5	5.3	60	13.5	7.1
42	12.6	6.3	63	9.4	4.3
47	5.9	3.5			

TABLE 2.—*Blood counts on rats fed a diet deficient in pantothenic acid*—Continued

Rat No.	Days on experiment	Total white blood cells per cu. mm.	Polymorphonuclear granulocytes per cu. mm.	Hematocrit volume percent
Rat with granulocytopenia alone				
44	55	2,750	100	44.3
Rats with anemia alone				
45	68	11,800	9,700	12.2
46	85	8,450	2,100	15.5
47	38	5,600	1,650	15.9
48	31	7,400	5,000	18.1
49	24	13,600	4,600	24.5
50	55	4,150	700	24.8
51	27	17,650	10,150	27.2
52	27	27,200	12,000	27.9
53	89	8,650	3,200	28.0
54	69	5,850	2,700	29.1
55	50	19,800	9,700	29.3
56	38	11,500	5,650	29.6
57	32	9,950	7,100	29.6
58	49	9,000	1,350	29.9
59	24	5,000	2,300	30.2
60	42	4,900	1,400	31.3
61	35	23,450	12,600	31.8
62	43	12,450	2,600	32.1
63	43	4,100	700	32.2
64	95	2,500	1,350	32.9
65	34	17,250	8,450	33.2
66	51	8,500	4,300	33.4
67	35	8,200	5,800	34.0
68	38	3,100	2,900	34.3
69	35	2,800	550	34.7
70	44	6,600	2,400	34.9
71	58	6,500	2,750	35.0
Rats with no defined blood dyscrasia				
72	65	14,800	4,600	35.6
73	71	9,500	2,400	35.9
74	29	5,650	1,500	36.0
75	77	7,000	3,400	36.5
76	62	11,400	4,400	37.1
77	175	8,150	2,700	38.8
78	70	9,600	3,200	39.2
79	24	10,000	800	39.5
80	20	12,600	3,400	39.9
81	56	17,050	1,900	40.0
82	38	----------	----------	41.4
83	46	8,850	4,500	41.8
84	36	7,250	3,600	42.2
85	38	14,400	8,000	43.5
86	29	2,900	1,200	44.3
87	38	----------	----------	44.6
88	36	7,500	950	44.8
89	47	10,000	1,400	45.2
90	69	5,850	3,200	46.3
91	37	3,350	1,000	53.3
92	28	16,450	6,800	54.8

In some rats, the onset of the blood dyscrasias, particularly the anemia, was extremely rapid and was followed closely by a fatal termination of the disease. Rats were examined every day although blood counts were not made as frequently. It was not uncommon to find that a rat's eyes, ears, mucous membranes, and foot pads were bright pink one day and extremely pallid the next. Gross evidences of internal or external hemorrhage or icterus were not present. In table 3 are given a few instances in which counts were obtained prior to the abrupt fall in the level of circulating cells.

TABLE 3.—*Rapidity of development of blood dyscrasias*

Rat No.	Date	Total white blood cells per cu. mm.	Polymorphonuclear granulocytes per cu. mm.	Hematocrit volume percent	Date	Total white blood cells per cu. mm.	Polymorphonuclear granulocytes per cu. mm.	Hematocrit volume percent	Date of death
34	June 7	2,650	600	38.0	June 13	1,250	50	27.5	(2)
36	June 14	6,900	900	38.9	June 20	900	0	25.0	June 22
41	June 20	3,800	1,700	35.1	June 24	900	150	31.7	June 26
47	Apr. 18	10,900	1,650	30.5	Apr. 22	5,600	1,650	15.9	Apr. 24
49 [1]	May 1	11,900	1,550	37.5	May 2	10,250	1,300	26.9	May 4
93	Apr. 22	3,050	850	38.1	Apr. 25	1,100	150	18.2	Apr. 27
94	Mar. 31			35.6	Apr. 2	750	50	22.2	(2)

[1] Previously had been treated successfully with pantothenic acid.
[2] Treated and recovered.

HISTOLOGICAL EXAMINATION OF THE BONE MARROW

Of the 69 rats listed in table 2, the vertebral and femoral bone marrow was studied in 25, 11 from the group showing both granulocytopenia and anemia, 12 from the group showing anemia only, and 2 from the group showing neither. Of the group showing both granulocytopenia and anemia, 10 rats showed hypoplasia of the bone marrow; it was marked in 5, moderate in 3, and slight in 2. The marrow of 1 rat showed no hypocellularity.

The markedly atrophic marrows also showed varying degrees of congestion, focal hemorrhage, and edema. Generally the stroma was loose in texture with very few scattered adult fat cells. In one of these rats the marrow was moderately fatty. Although severely hypoplastic, a few nucleated red cells and granulocytes were present in all marrows, the latter being least common. The nucleated red cells occurred in very small clusters or, more frequently, were evenly scattered throughout the marrow. Granulocytes occurred most often in very small groups in a peripheral location. A very few of these cells were identified as metamyelocytes and segmented forms; most of these were myelocytes or younger forms. Megakaryocytes were not found in any of these marrows.

In marrows showing only slight to moderate cell depletion, the decrease in the number of cells appeared to occur mainly in the granulocytic series and in some cases cells of the erythroid series appeared to be actually increased in number. In such cases of slight to moderate marrow hypoplasia, the congestion was much less than in the advanced cases and hemorrhage and edema usually were absent.

The bone marrow of the rats with anemia only showed atrophy less frequently and less severe than those with both anemia and granulocytopenia. Of the 12 anemic rats studied, the bone marrow of 8 showed no decrease in cellularity. In 3 there was slight atrophy and in 1 the atrophy was of moderate degree.

The marrow of the control rats in this experiment was not studied. Interpretation of the findings in the marrow of the rats on the deficient regimen was made by comparison with marrow sections of control rats of the same strain and age group used in other experiments.

TREATMENT OF DYSCRASIAS

The results to be considered in this section were obtained partly with animals mentioned under "Development of Dyscrasias" (page 1202) and partly with a larger group of similar animals. Some of these animals developed blood dyscrasias while receiving the *L. casei* factor, at a level of 2 or 20 micrograms per rat per day, or pantothenic acid at a level of 2 or 5 micrograms per rat per day. The nature and amount of such supplementation are given, together with the nature and the results of therapy, in tables 4, 5, and 6. Diets No. 939 and No. 966, described in the previous section, were employed throughout.

Treatment consisted of the daily oral administration for 4 days (in a few cases 10 days) of pantothenic acid, fermentation *L. casei* factor (replaced by synthetic *L. casei* factor in a few animals, as noted), or the indicated combination of the two vitamins. Blood determinations were made the day treatment was started, and were repeated, for granulocytopenic rats, at the termination of the 4-day treatment period and, for anemic rats, after the lapse of approximately 6 additional days. Experience has shown that there may be no increase in hematocrit or hemoglobin values or in red cell counts in 4 days, even when treatment for this length of time initiates changes observable at the end of an 8–10-day period.

The fulminating character of the deficiency disease has proved to be a considerable handicap in the accumulation of data concerning therapy. Only a small percentage of treated animals survived the treatment test period. This was true even when the therapeutic measures employed were such as to bring about a correction of the blood dyscrasias in most or all of the animals which lived for the necessary 4 or 8 to 10 days following the beginning of therapy. Because of the difficulty of obtaining adequate therapeutic data, a few animals were treated as granulocytopenic even though the level of circulating granulocytes was slightly above 400 cells per cubic millimeter. We do not feel that it is possible at the present time to evaluate the failure of so many treated animals to survive. In view of the uncertainty concerning the significance of these early deaths we have adopted the procedure of reporting data concerning treatment only for those granulocytopenic animals which survived a 4-day test period and for those anemic animals which lived for at least 8 days from the time treatment was begun.

The results of treatment of anemic animals which were not granulocytopenic are given in table 4. Each of 12 rats treated with panto-

TABLE 4.—*Anemic rats; changes in blood values following treatment*

Rat No.	Treatment			Hematocrit [1] volume percent				Polymorphonuclear granulocytes per cu. mm.				Weight gain or loss following initiation of therapy, gm./10 days	Remarks
	Panto-thenic acid (micro-grams)	*L. casei* factor (micro-grams)	Days of therapy	Number of days after beginning of treatment [2]									
				0	4	10	16	0	4	10	16		
49	200		4	24	27	31	37	4,600	8,800	1,050	2,650	+3	
51	200		4	27		41		10,150		10,800		+6	
53	200		4	32	28	42		3,700	3,200	3,100		+22	
55	200		4	29	31(5)	39(12)	55(27)	9,700		5,600(12)	13,200(27)	+3	
58	200		4	30		53(8)		1,350				+2(4)	
95	5,000		4	32	34	38	45	1,500	2,400	900	1,400	+86	Received 2 micrograms of pantothenic acid daily from weaning.
96	200		4	29		47		2,700		1,000		+28	
97	200		4	29	33	43(11)		700	1,250	1,350(11)		+30	
98	200		4	25		35	41	3,050		2,000	5,400	+16	
99	200		4	30		41		2,500		400		+18	Further treatment was begun at end of 10-day period. See table 5.
100	200		4	19		39		5,600		100		+28	Do.
101	200		4	33		36		1,750		250		+5	
48		100	4	27	18	18(8)		1,850	5,000			−5(8)	
52		100	4	28	28	42(11)		12,000	7,150	1,250(11)		0	
59		100	4	30	28	34	37(17)	2,300	1,800	6,000	4,050(17)	+1	
102		100	4	21	13(6)	12		1,650		7,100		−3	
103		100	4	31	34	25(11)	27(19)	800	700	400(11)	750(19)	+3	Received 2 micrograms of *L. casei* factor daily from weaning.
104		100	4	29	28	16(9)		8,600	3,200	9,800(9)		−6(9)	Do.
105		100	4	27	22	17		4,150	9,500			+2	Do.
106		25	4	26	29	12		3,400	3,550	36,000		+2	
107		25	4	21	28	43(11)		3,050	2,800	4,850(11)		+5	
108		25	4	33	40	43(8)		2,950	7,800			−3(4)	Synthetic, *L. casei* factor.[3]
109		25	10	21	12	13(9)		2,200	650	2,650(9)		−5(9)	Do.
110		25	4	22	47	49		3,400	2,400	2,000		−6	Received amino acid solution in place of drinking water during treatment period.[4]
111		100	4	27	37	31(11)		1,050	1,250	3,000(11)		+5	Do.
112		100	10	26	19	12(9)		2,800	1,300	0(9)		−4	Do.

113	200	25	4	19	30	42	45 (27)	2,200	6,100	4,850	1,850 (27)	+27	
114	200	25	4	28	41	44	9 (19)	30,000	14,400	2,450	100 (19)	+29	
115	200	25	4	15	35	43	49 (24)	2,000	21,200	1,600	1,000 (24)	+20	
116	200	25	4	22	34	62	----------	2,150	19,600	200	50 (13)	+8	Further treatment was begun at end of 13-day period. See table 5.
117	200	25	4	31	----------	48 (11)	----------	9,600	----------	16,000 (11)	----------	+21	
118	200	25	4	25	29	35 (11)	36 (15)	700	2,350	50 (11)	100 (15)	-7	
119	200	25	4	32	26	28	----------	1,750	----------	50	----------	+6	Further treatment was begun at end of 10-day period. See table 6.

[1] The hemoglobin values and red blood cell counts which were obtained are as follows:

Rat No.	Hemoglobin in gm. per 100 cc.				Total red blood cells, millions (per cu. mm.)				Rat No.	Hemoglobin in gm. per 100 cc.				Total red blood cells, millions (per cu. mm.)			
	0	4	10	16	0	4	10	16		0	4	10	16	0	4	10	16
49	5.8	6.3	7.4	10.3	3.0	----------	3.4	4.1	106	6.6	7.0	2.2	----------	3.1	3.3	1.0	----------
51	6.6	----------	13.0	----------	3.3	----------	5.3	----------	107	5.2	7.0	12.4 (11)	----------	2.2	3.6	4.5 (11)	----------
55	10.9	----------	11.4 (12)	----------	6.5	----------	4.2 (12)	----------	116	4.1	7.5	----------	----------	2.0	5.1	----------	----------
58	11.0	----------	----------	----------	5.0	----------	----------	----------	117	9.3	----------	14.0 (11)	----------	----------	----------	----------	----------

[2] Except where different number of days is indicated by figure in circle.
[3] Furnished through the courtesy of Dr. E. L. R. Stokstad of Lederle Laboratories, Inc., Pearl River, N. Y.
[4] Amino-acid mixture Vx of Bassett et al. (*11*). 100 gm. were dissolved in water and made to a volume of 2,000 ml.

thenic acid showed some increase in the hematocrit reading in approximately 10 days although only 6 of the 12 reached a level as high as 40 volumes percent at this time. Of the 6 which failed to reach this value at 8 to 12 days, 4 reached levels of 37, 41, 45, and 55 volumes percent at 16, 16, 16, and 27 days, respectively, from the beginning of treatment. The other 2 (rats No. 100 and No. 101) became granulocytopenic during the 10-day test period and were subsequently treated with additional pantothenic acid.[5] One (No. 101) succumbed on the thirteenth day before another blood examination was made; the other remained granulocytopenic and became very anemic before it died on the twenty-third day (see table 5, rat No. 100). Of the 14 animals[6] treated with *L. casei* factor, 4 reached hematocrit levels above 40 volumes percent in 4 to 11 days, one appeared to respond slowly reaching a level of 37 volumes percent in 17 days, and the other 9 failed to respond. Of 7 rats treated with pantothenic acid and *L. casei* factor combined, 5 reached hematocrit levels above 40 volumes percent in 4 to 11 days; 1 gave a smaller response, and 1 failed to respond.

The results of therapy of granulocytopenic animals which were not anemic are given in table 5. Fourteen[7] such animals were treated with the *L. casei* factor, 7 were treated with pantothenic acid, and 6 were treated with a combination of the two. Of the 14 treated with the *L. casei* factor alone, 10 gave good responses in 4 days. The 4 which failed to respond became anemic during the treatment period.[8] Three of these died before additional counts were made; the other (No. 32) showed a delayed response. Of the 7 rats treated with pantothenic acid alone, none responded in 4 days or 10 days but 3 of the 4 which lived for more than 16 days finally did respond. Treatment with both vitamins together gave results similar to treatment with *L. casei* factor alone. Three of the six gave good responses in 4 days; 1 responded poorly (an increase to 650 from 0 granulocytes per cubic millimeter) and 2 failed to respond. The 3 which failed to show a good response in 4 days became anemic during the treatment period. Two of these died before additional counts were made; the other (No. 140, treated for 10 days) showed a delayed response.

The results of treatment of animals which were both anemic and granulocytopenic are given in table 6. Six rats[9] were treated with the *L. casei* factor alone, five with pantothenic acid alone, and six

[5] Rat No. 99 also became granulocytopenic during the 10-day test period. It was treated successfully with additional pantothenic acid as indicated in table 5.

[6] Three of these fourteen received amino acids during the treatment period. See footnote 9.

[7] Six of these fourteen received amino acids during the treatment period. See footnote 9.

[8] Two of the ten which responded also became anemic during treatment.

[9] Two of these six animals received amino acids during the treatment period. (Compare footnotes 6 and 7 and see tables 4, 5, and 6). This procedure did not appear to affect the results which are therefore included. The use of amino acids in the therapy of granulocytopenic animals is under investigation.

TABLE 5.—*Granulocytopenic rats; changes in blood values following treatment*

Rat No.	Treatment: Pantothenic acid (micrograms)	Treatment: *L. casei* factor (micrograms)	Treatment: Days of treatment	Total white blood cells per cu. mm.: 0	4	10	16	Total polymorphonuclear granulocytes per cu. mm.: 0	4	10	16	Red blood cell volume (hematocrit) in cc. per 100 cc.: 0	4	10	16	Weight gain or loss following initiation of therapy gm./10 days	Remarks
				Number of days after beginning of treatment [1]													
120	------	100	4	4,500	6,200	4,900 (11)	------	450	2,250	1,850 (11)	------	42	41	37 (11)	------	+1	Received 2 micrograms of *L. Casei* factor daily from weaning.
121	------	100	4	2,350	7,350	------	8,600	350	2,350	------	4,150	40	37	------	42	−3 (4)	
122	------	25	4	5,900	11,150	9,550	------	150	2,800	5,600	------	42	34	34	------	−7	Do.
123	------	25	4	5,000	5,700	2,750	------	300	1,550	1,050	------	39	42	40	------	+3	Do.
32	------	25	4	1,950	2,350	30,600	13,550	150	400	15,900	2,450	40	17	22	40	−5	
124	------	25	4	900	550	------	------	100	0	------	------	49	34	------	------	------	
40	------	25	4	650	250	------	------	50	0	------	------	37	29	------	------	−5	
125	------	25	4	2,500	600	------	------	400	0	------	------	37	25	------	------	−5 (4)	Do.
126	------	25	4	2,800	3,400	------	------	100	2,100	------	------	37	24	------	------	−2 (4)	Received amino-acid solution in place of drinking water during treatment period. See footnote 3, table 4.
127	------	25	4	2,500	10,100	4,150 (8)	------	50	4,300	1,450 (8)	------	46	42	39 (8)	------	−6 (4)	Do.
128	------	25	4	3,350	7,550	10,100	------	200	2,150	2,550	950	41	44	41	24	−5	Do.
129	------	100	4	950	3,000	5,150 (13)	------	200	1,250	2,900 (13)	------	39	39	32 (13)	------	−2	Do.
130	------	100	4	3,700	6,850	650 (12)	------	50	2,300	0 (12)	------	43	45	19 (12)	------	0	Do.
131	------	100	4	3,000	18,000	17,800 (8)	------	250	11,200	8,200 (8)	------	42	45	27 (8)	------	−7 (4)	Do.
99	5,000	------	4	2,800	2,450	3,250	9,250 (20)	400	500	600	4,650 (20)	41	43	44	51 (20)	+21	Had been successfully treated for anemia. See table 4.
132	5,000	------	4	3,600	2,100	4,600	5,550 (20)	50	150	400	1,950 (20)	41	40	38	37 (20)	+12	
44	200	------	4	2,850	3,300	2,750	4,400 (17)	350	550	100	1,450 (17)	38	40	44	44 (17)	+16	
133	5,000	------	4	4,450	4,350	4,250	3,900 (20)	200	0	0	0 (20)	50	33	37	39 (20)	+19	
100	5,000	------	4	1,150	850	1,200	------	100	100	150	------	39	17	6	------	−16	Do.
134	200	------	4	1,050	350	------	------	50	0	------	------	36	17	------	------	+8 (4)	
135	200	------	4	2,500	1,900	------	------	350	200	------	------	41	42	------	------	0 (4)	
136	200	25	4	1,450	53,800	31,700 (9)	650 (26)	150	50,500	5,100	0 (26)	39	39	36	21 (26)	+1	
137	200	25	4	2,100	15,700	------	------	550	12,400	------	------	47	40	------	------	−1 (4)	
116	200	25	------	350	7,400	------	------	0	4,800	------	------	62	53	------	------	+1 (4)	Do.
138	200	25	4	600	2,350	------	------	0	650	------	------	40	30	------	------	−4 (4)	
139	200	25	4	150	300	------	------	0	50	------	------	42	27	------	------	0 (4)	
140	200	25	10	350	750	2,700	8,000	50	0	500	5,400	42	32	29	41	+16	

[1] Except where different number of days is indicated by figure in circle.

TABLE 6.—*Treatment of rats which were both anemic and granulocytopenic: Changes in blood values*

Rat No.	Treatment: Panto-thenic acid (micro-grams)	Treatment: *L. casei* factor (micro-grams)	Treatment: Days of treat-ment	Total white blood cells per cu. mm.: 0	4	10	Total polymorphonuclear granulocytes per cu. mm.: 0	4	10	Red blood cell volume[1] (hematocrit) in cc. per 100 cc.: 0	4	10	Weight gain or loss following initiation of therapy grams/10 days	Remarks
				Number of days after beginning of treatment[2]										
25	-	100	4	2,250	1,600	-	150	50	-	34	26	6 (8)	0 (4)	
27	-	25	4	2,450	700	1,400	50	50	100	35	21	10	−5	
30	-	25	4	2,150	3,100	600 (8)	400	250	50 (8)	27	24	15 (8)	−2 (4)	
141	-	25	4	1,500	1,400	-	50	150	-	34	9	-	−5 (4)	Received 2 micrograms of *L. casei* factor daily from weaning.
142	-	100	4	3,100	1,400	-	0	50	-	31	6	-	−10 (4)	Received amino-acid solution in place of drinking water during treatment period See footnote 3, table 4.
143	-	100	4	850	200	-	50	0 (3)	-	31	35 (3)	-	−10 (3)	Do.
144	5,000	-	4	6,250	65,600	9,600	450	2,450	3,400	21	24	42	+28	
145	5,000	-	4	1,350	1,300	4,900	100	50	2,900	33	31	44	−6	
146	5,000	-	4	1,750	4,000	5,550	450	850	1,250	29	35	42	+28	
35	200	-	4	1,350	1,500	-	50	0	-	25	24	-	+17 (4)	
147	5,000	-	4	1,850	450	-	100	0	-	33	17	-	+3 (4)	
119	200	25	4	1,600	25,200	4,050	50	17,600	1,450	28	35	31	−3	Had been unsuccessfully treated for anemia. See table 4.
94	200	25	4	750	5,050	4,950 (44)	50	1,650	2,250 (44)	22	42	55 (44)	+19	
148	200	25	4	800	1,000	5,400	0	350	3,550	26	19	35	−6	
38	50	5	4	2,050	4,300	6,050	150	1,300	800	25	37	40	+31	
84	50	5	4	1,250	1,600	3,850	50	150	2,350	28	19	38	+6	Received 20 micrograms of *L. casei* factor daily from weaning.
149	200	20	4	400	750	4,850 (11)	0	400	1,550 (11)	25	27	42 (11)	+20	

[1] The hemoglobin values and red blood cell counts which were obtained are as follows:

Rat No.	Hemoglobin in gm. per 100 cc.: 0	10	Total red blood cells, millions per cu. mm.: 0	10
27	13.4	4.7	7.0	1.9
138	11.8	-	7.0	-
35	10.4	-	5.6	-
94	6.7	-	-	-
38	9.2	12.8	4.8	6.7
34	10.5	12.2	6.8	5.7
145	9.0	13.3 (11)	4.4	5.4 (11)

[2] Except where different number of days is indicated by figure in circle.

with both of these vitamins together. None of the six rats treated with the *L. casei* factor responded either by an increase in the level of circulating granulocytes or by an increase in the hematocrit reading. Of the five treated with pantothenic acid, one showed a good granulocyte response at 4 days and two others at 10 days. The remaining two failed to respond at 4 days and died before another count was obtained. The three animals which lived for 10 days showed increases in the hematocrit values. Of the six animals treated with a combination of *L. casei* factor and pantothenic acid, each gave a good granulocyte response in 4 to 11 days. Hematocrit responses to some extent paralleled the granulocyte responses but were less consistent.

DISCUSSION

In these experiments, anemia and granulocytopenia have developed in rats deprived of pantothenic acid. Nevertheless these dyscrasias appear not to have been signs of an uncomplicated deficiency of this vitamin.

The granulocytopenia, when unaccompanied by anemia, probably was a sign simply of an *L. casei* factor deficiency. This deficiency may have been present in some anemic animals as well. The prophylactic administration of pantothenic acid appears to have prevented the development of an *L. casei* factor deficiency; its therapeutic administration may at times have corrected this deficiency.

The blood dyscrasias observed in rats deprived of pantothenic acid were not ascribable solely to an *L. casei* factor deficiency. The development of anemia appears to have indicated (perhaps with less than complete reliability) the presence of a deficiency affecting hematopoiesis other than that of the *L. casei* factor.

This other deficiency affecting hematopoiesis may have been that of pantothenic acid. There is little or no evidence at hand to the contrary. However, we have seen that the uncomplicated granulocytopenia which occurred in some pantothenic acid-deficient rats was attributable to a deficiency, not of pantothenic acid, but of quite another vitamin. It is possible that a similar mechanism was operative in the appearance of the anemia, with the difference that instead of, or in addition to, *L. casei* factor deficiency there developed a deficiency of an unidentified vitamin. We are unable to state at this time whether the relationship between pantothenic acid and *L. casei* factor deficiencies represents an isolated phenomenon or whether something of general significance is involved.

The discussion of the interpretation of these experimental results would not be complete without mention of three additional points:

1. Most of the *L. casei* factor we have used is a fermentation product. We have no reason to believe that the activity of liver *L. casei* factor

would have been qualitatively different in these experiments but it is a possibility to be considered.

2. It is well known that some degree of inanition accompanies pantothenic acid deficiency in rats. Preliminary investigations of the possible influence of lowered food intake on the development of blood dyscrasias have been carried out (*12*).[10] It appears probable, on the basis of the information at present available, that inanition influences the level of circulating granulocytes but not to an extent sufficient to account for the incidence and the severity of the granulocytopenia observed in pantothenic acid-deficient rats.

3. From inspection of blood smears, it appears that some of our pantothenic acid-deficient rats have infections of *Bartonella muris* (*13*). We have not found it possible, however, to correlate the presence or the severity of the infection with the presence or severity of the anemia.

The syndrome we have described may be identical with the panmyelophthisis of György, Goldblatt, Miller, and Fulton (*14*). We have not studied platelets but the remainder of the blood picture corresponds very well with their findings. The bone-marrow changes in our rats are similar to, though generally less severe than, those described by György et al. On the other hand, these investigators stated that panmyelophthisis was not cured or prevented by a "supposedly active filtrate factor preparation." Since all active "filtrate factor" preparations presumably contained pantothenic acid this observation might be taken as indicating a lack of identity of the deficiency states observed in the two laboratories. Additional information is needed on this point.

SUMMARY

Rats given certain purified diets which were low in pantothenic acid developed anemia, leucopenia, granulocytopenia, and bone-marrow hypoplasia.

The inclusion of pantothenic acid in these diets almost completely prevented the appearance of these deficiency signs.

Therapy with pantothenic acid was much less successful than was prophylaxis. Anemic animals appeared to respond to this treatment somewhat more consistently and rapidly than did those which were granulocytopenic.

[10] Twenty-two pairs of rats have been studied in an experiment involving paired feeding. One rat of each pair was given pantothenic acid-deficient diet No. 966; the other was allowed the same amount of a diet which differed only in that it contained 2 mg. of calcium pantothenate per 100 gm. of diet. Eight of the pantothenic acid-deficient rats were observed with levels of circulating polymorphonuclear granulocytes of 400 cells per cubic millimeter or less (of these 8, 7 were below 200). In addition, 3 animals showed levels between 400 and 1,000. Four of the pair-fed litter mates which received pantothenic acid were observed with levels of circulating polymorphonuclear granulocytes of 400 cells per cubic millimeter or less (none below 200). In addition, 7 rats showed levels between 400 and 1,000.

Evidence is presented which indicates that one result of withholding pantothenic acid from these experimental animals was the development of an *L. casei* factor deficiency.

The nature of the additional deficiency or deficiencies is discussed.

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TSUTSUGAMUSHI DISEASE (SCRUB TYPHUS). THE EFFECTS OF AN IMMUNE RABBIT SERUM IN EXPERIMENTALLY INFECTED MICE [1]

By NORMAN H. TOPPING, *Surgeon, United States Public Health Service*

Immune rabbit serum has been described for several of the rickettsial agents (*1*, *2*). The immune serum for Rocky Mountain spotted fever has had a clinical trial and, although the series of cases was not

[1] From the Division of Infectious Diseases, National Institute of Health. This paper was approved for publication May 9, 1944, and scheduled for publication in PUBLIC HEALTH REPORTS in the issue of May 26, 1944. Because of the subject matter the paper was withheld from publication at that time.

large, the results seemed to warrant the use of the serum as a therapeutic agent in this disease (*3*). As in other diseases, there was evidence that the serum, to be of benefit, must be given in adequate doses as early as possible in the course of illness. In Rocky Mountain spotted fever the diagnosis can only be suspected until the diagnostic rash appears, usually late in the third or early in the fourth day of the febrile period; a definite reduction in the expected case-fatality rates occurred only in those cases where the serum was administered on or before the third day of the rash.

From a clinical standpoint, tsutsugamushi disease might lend itself more readily to therapy and even perhaps prophylaxis with an immune serum than does Rocky Mountain spotted fever. There is observed fairly constantly in tsutsugamushi, at least as it occurs in the white race, an eschar or initial lesion present at the onset of the febrile period (*4*). Cases of the disease have occurred in which the initial lesion was observed by the patient some days before the onset of the febrile period (*5*, *6*). With the eschar as an early diagnostic feature, the disease may be recognized very early in its course. It would seem that the earlier the recognition the better the chances that an immune serum or some other therapeutic agent would be of benefit. Two chemotherapeutic agents, para-sulphonamido-benzamidoxime hydrochloride (*7*) and penicillin, were tried in infected white mice but there was no evidence of a favorable effect (*8*, *9*).

PREPARATION OF IMMUNE RABBIT SERUM

An immune rabbit serum has been prepared, and in preliminary trials in infected laboratory mice the effect has been sufficient to warrant a brief note. Injection of yolk-sac material infected with the "Karp" strain of tsutsugamushi was begun in four rabbits December 16, 1943. On 2 consecutive days each week for 3 weeks the rabbits received 1 cc. intravenously of a 10^{-1} dilution of a pool of infected yolk sacs that consistently killed white mice when 0.5 cc. of a 10^{-4} dilution was inoculated intraperitoneally. Nineteen days after the last of these six injections the rabbits were bled (January 19, 1944). The serums were separated from the clots and kept in the refrigerator. These serums were tested for complement-fixing antibodies. It was found that one of the rabbits, No. 185, had developed slightly higher fixation with the specific antigen than the others. Serum of this rabbit was used in a preliminary test in mice. After a rest period of several weeks the rabbits were again injected with infectious material (February 14, 1944). The first injection after the rest period was given subcutaneously; the next day an intravenous injection was given; the following week two intravenous injections were given on consecutive days. After approximately 18 days, the rabbits were

again bled for serum (March 9, 1944). The serum from the same rabbit was again tested in infected mice.

INFECTIOUS INOCULUM FOR MICE

Two yolk sacs weighing 8 gm., infected with the "Karp strain," were ground in a blender and then diluted with 80 cc. of sterile skimmed milk (approximately 10^{-1}). This material was then distributed in convenient-sized ampules, shell-frozen rapidly, and stored at approximately −40° C. When this material was thawed and 0.5 cc., in dilutions up to and including 10^{-4}, inoculated intraperitoneally into white mice, they died consistently. An occasional death occurred at 10^{-5}. It therefore appeared that 0.5 cc. of a 10^{-4} dilution contained between 1 and 10 minimal lethal doses for white mice. Dilutions of this pool of frozen infectious material were used throughout the tests of the homologous immune serum in mice.

PROCEDURE

White mice were inoculated intraperitoneally with 0.5 cc. of tenfold dilutions of the infectious pool. At varying periods following inoculation each of the treated mice received a single subcutaneous injection of 0.2 cc. of the crude unpreserved immune rabbit serum. Table 1 summarizes the results obtained with the serum of January 19, 1944, from rabbit No. 185. All deaths which occurred during a period of 40 days are recorded, regardless of cause of death. It will be noted that there was definite delay in the time of death in the treated mice infected with 10^{-3} and 10^{-4} dilutions. There were also some survivors in the 10^{-4} dilution group.

Serum from the same rabbit, No. 185, but from a bleeding following another series of injections with live antigen, March 9, 1944, was tested similarly in mice. The infectious dose was 0.5 cc. intraperitoneally of 10^{-3} and 10^{-4} dilutions from the frozen pool. All deaths that occurred during an observation period of 40 days are recorded in table 2. It will be noted in this table that a very definite effect was produced by the immune serum when given for as long as 72 hours after the 10^{-3} infectious dose and for 120 hours after the 10^{-4} dose of the infectious pool. The serum dosage in this test was kept at the 0.2-cc. amount as it was in the first test.

It was thought that perhaps a little larger dose might be effective when given at a later time after infection of the mice. Table 3 records the results with 0.5 cc. immune serum when mice are infected with 0.5-cc. amounts of 10^{-3} and 10^{-4} dilutions from the Karp infectious pool. As indicated in the table, the mice were observed for 30 days. The effect was obtained as late as 7 days in both the 10^{-3}- and 10^{-4}-dilution infected mice with the larger serum dosage.

TABLE 1.—*Results following inoculation of mice with tsutsugamushi-infected yolk sac (Karp strain) followed by injection of 0.2 cc. immune rabbit serum. Immune serum obtained from rabbit No. 185, bleeding of January 19, 1944*

Number of mice	Infectious dose, Karp yolk-sac pool, 0.5 cc.	Hours after infectious dose 0.2 cc. immune serum was given	Deaths, by days after infection																														Total deaths	Number of survivors
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31–40		
4	10^{-2}	18											2	1					1															4	0
4	10^{-2}	48									2	1		1																				4	0
4	10^{-2}	90									1		1	1						1														4	0
4	10^{-2}	120								1	3																							4	0
4	10^{-2}	No immune serum								2	1	1																						4	0
4	10^{-3}	18														1				1			1											3	1
4	10^{-3}	48															1	1			1											1		4	0
4	10^{-3}	90															1	2		1														4	0
4	10^{-3}	120										1	1	1																			[1] 1	4	0
4	10^{-3}	No immune serum									1	1	1		1																			4	0
4	10^{-4}	18																	1													1		2	2
4	10^{-4}	48														1						1												2	2
4	10^{-4}	90								1									2															3	1
4	10^{-4}	120																														2	[1] 1	3	1
4	10^{-4}	No immune serum												1	1	1					1													4	0

[1] Dead on fortieth day.

TABLE 2.—*Results following inoculation of mice with tsutsugamushi-infected yolk sac (Karp strain) followed by injections of 0.2 cc. immune rabbit serum. Immune serum obtained from rabbit No. 185, bleeding of March 9, 1944*

Number of mice	Infectious dose, Karp yolk-sac pool, 0.5 cc.	Hours after infectious dose 0.2 cc. immune serum was given	Deaths, by days after infection																														Total deaths	Number of survivors
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31–40		
4	10^{-3}	24				1																												1	3
4	10^{-3}	72																	1															1	3
4	10^{-3}	120												1		2	1																	4	0
4	10^{-3}	192									1	1	2																					4	0
4	10^{-3}	No immune serum									1		1	1		1																		4	0
4	10^{-4}	24																												1				1	3
4	10^{-4}	72																															[1] 1	1	3
4	10^{-4}	120														1			1															2	2
6	10^{-4}	No immune serum												1		5																		6	0

[1] Dead on thirty-fifth day.

TABLE 3.—*Results following inoculation of mice with tsutsugamushi-infected yolk sac (Karp strain) followed by injection of 0.5 cc. of immune rabbit serum. Immune serum obtained from rabbit No. 185, bleeding of March 9, 1944*

Number of mice	Infectious dose, Karp yolk-sac pool, 0.5 cc.	Hours after infectious dose 0.5 cc. immune serum was given	Deaths, by days after infection																														Total deaths	Number of survivors
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
4	10^{-3}	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	4
4	10^{-3}	168	--	--	--	--	--	--	--	--	--	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	2
4	10^{-3}	No immune serum	--	--	--	--	--	--	--	--	--	1	2	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4	0
4	10^{-3}	No immune serum	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	4	0
4	10^{-4}	96	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	1	3
[1] 3	10^{-4}	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	[2] 1	--	--	--	--	--	--	--	--	--	--	--	1	2
5	10^{-4}	No immune serum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	1	1	--	--	--	--	1	--	--	--	--	--	--	--	--	5	0
4	10^{-4}	No immune serum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2	--	1	--	1	--	--	--	--	--	--	--	--	--	--	4	0

[1] Due to shortage of serum, 2 mice treated 0.5 cc. serum; 1 mouse (Blue) treated 0.3 cc. serum. The fourth mouse in this jar untreated and placed in next jar with controls.
[2] Blue.

TABLE 4.—*Results following inoculation of mice with tsutsugamushi-infected yolk sac (Karp strain) followed by injection of 0.2 cc. of immune rabbit serum. Immune serum obtained from rabbits Nos. 13, 186, and 187, bleeding of March 9, 1944*

Immune serum from rabbit No. —	Number of mice	Infectious dose, Karp yolk-sac pool, 0.5 cc.	Hours after infectious dose 0.2 cc. immune serum was given	Deaths, by days after infection																														Total deaths	Number of survivors
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30		
13	4	10^{-4}	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1	1	--	--	--	--	--	--	--	3	1
	4	10^{-4}	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1	--	--	--	--	--	--	2	2
	4	10^{-4}	168	--	--	--	--	--	--	--	--	--	--	--	--	1	--	1	1	--	--	--	--	--	1	--	--	--	--	--	--	--	--	4	0
186	4	10^{-4}	24	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	3
	4	10^{-4}	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	4
	4	10^{-4}	168	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--	--	--	--	--	1	--	--	--	--	--	--	3	1
187	4	10^{-4}	24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0	4
	4	10^{-4}	72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	3
	4	10^{-4}	168	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1	1	--	--	--	--	--	--	--	--	--	--	3	1
	4	10^{-4}	No immune serum	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	1	1	--	--	1	--	--	--	--	--	--	--	--	4	0

Since all the previously described tests were done with the serum from only one (No. 185) of the four rabbits, a test was made with the other three rabbit serums (Nos. 13, 186, and 187). The mice were infected with 0.5 cc. of a 10^{-4} dilution of the Karp infectious pool. They were treated at varying periods later with 0.2 cc. of serum secured from the rabbits in a bleeding of March 9, 1944 (after two series of live-antigen inoculations). The results of this test are summarized in table 4. It will be noted that the serum from rabbit No. 13 was apparently not as efficient as that from No. 186 or No. 187. These two produced a result comparable to that observed with the serum of rabbit No. 185.

DISCUSSION AND SUMMARY

It has been demonstrated that rabbits suitably inoculated with live antigen from a strain of tsutsugamushi (scrub typhus) develop protective antibodies. A second series of inoculations apparently raises the protective antibody titre. These antibodies can be passively transferred to mice previously infected with certainly lethal doses of yolk-sac material from the homologous strain. Death can be prevented in these infected mice, when treated with the serum, after a lapse of 72 to 168 hours from the time of infection. In these tests it appeared that the larger dose was more effective than was the smaller.

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INCIDENCE OF HOSPITALIZATION, AUGUST 1945

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover hospital service plans scattered throughout the country, mostly in large cities.

Item	August	
	1944	1945
1. Number of plans supplying data	74	81
2. Number of persons eligible for hospital care	13, 670, 371	18, 499, 662
3. Number of persons admitted for hospital care	133, 758	176, 672
4. Incidence per 1,000 persons, annual rate, during current month (daily rate×365)	115. 5	112. 4
5. Incidence per 1,000 persons, annual rate for the 12 months ended August 31, 1945	105. 1	105. 5
6. Number of plans reporting on hospital days	20	31
7. Days of hospital care per case discharged during month [1]	6. 13	7. 61

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

DEATHS DURING WEEK ENDED SEPTEMBER 15, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 15, 1945	Corresponding week, 1944
Data from 91 large cities of the United States:		
Total deaths	8, 173	7, 737
Average for 3 prior years	7, 818	
Total deaths, first 37 weeks of year	330, 517	332, 323
Deaths, under 1 year of age	621	596
Average for 3 prior years	587	
Deaths under 1 year of age, first 37 weeks of year	22, 308	22, 724
Data from industrial insurance companies:		
Policies in force	67, 276, 041	66, 723, 794
Number of death claims	11, 251	12, 797
Death claims per 1,000 policies in force, annual rate	8. 7	10. 0
Death claims per 1,000 policies, first 37 weeks of year, annual rate	10. 3	10. 1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 22, 1945

Summary

Following a rise last week, the incidence of poliomyelitis for the country as a whole again declined. A total of 864 cases was reported currently, as compared with 963 last week (the highest weekly incidence to date this year), 1,158 for the corresponding week last year, and a 5-year median (1940–44) of 796. Decreased incidence was recorded in the Middle Atlantic, West Central, and Mountain areas, while increases occurred in the New England, East Central, South Atlantic, and Pacific areas. Of 25 States reporting 10 or more cases, 11 reported a net increase of 83 cases, 12 a decrease of 183, and 2 States, Virginia and Utah, reported the same numbers for both weeks (19 and 22, respectively). States reporting more than 15 cases each are as follows (last week's figures in parentheses): *Increases*—Massachusetts 51 (45), Ohio 37 (31), Illinois 93 (66), Wisconsin 48 (39), Tennessee 21 (15), California 54 (46); *decreases*—New York 110 (148), New Jersey 55 (87), Pennsylvania 48 (95), Minnesota 23 (25), Texas 39 (44), Washington 20 (25). Missouri also reported a decrease from 24 to 9 cases. To date this year 8,883 cases have been reported, as compared with 13,570 for the same period last year and a 5-year median of 5,803.

Of a total of 83 cases of meningococcus meningitis reported for the current week, as compared with 93 last week and 73 for the next earlier week, 14 occurred in New York and 11 in California. The seasonal low was probably reached during the week ended September 1, when 61 cases were reported. The total for the year to date is 6,578, as compared with 13,729 and 14,331, respectively, for the corresponding periods of last year and 1943, and a 5-year median of 2,623.

Of 31 cases of infectious encephalitis reported currently, 24 occurred in California, which State has reported 204 of the total of 455 cases to date this year.

A total of 8,205 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,238 last week, 8,027 for the corresponding week last year, and a 3-year (1942–44) average of 8,049. The total to date is 341,548, as compared with 343,526 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended September 22, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders inply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944	
NEW ENGLAND												
Maine	2	1	0	1			1	3	10	0	3	1
New Hampshire	0	0	0				0	3	0	0	0	0
Vermont	2	0	0				0	2	2	0	0	0
Massachusetts	4	3	4				41	26	31	[3] 2	1	3
Rhode Island	0	0	0	15	2		1	0	0	0	1	0
Connecticut	0	1	1		1	1	0	6	6	0	2	0
MIDDLE ATLANTIC												
New York	11	10	7	[1] 2	(1)	[1] 2	11	17	43	14	13	5
New Jersey	4	4	3			2	6	9	32	5	5	2
Pennsylvania	5	5	7	2			32	51	51	3	8	4
EAST NORTH CENTRAL												
Ohio	6	7	6	2		4	14	5	14	4	3	1
Indiana	9	4	9	2	4	12	2	2	10	4	1	1
Illinois	1	6	10		4	4	32	8	19	2	11	2
Michigan [2]	20	3	1	1	2	2	35	13	22	1	4	2
Wisconsin	2	0	0	12	12	14	20	21	34	0	3	2
WEST NORTH CENTRAL												
Minnesota	4	13	4				5	4	6	2	2	1
Iowa	0	4	4				4	1	8	0	1	1
Missouri	4	1	9	2		1	3	5	5	5	14	1
North Dakota	2	7	2		1	1	0	1	2	0	0	0
South Dakota	1	7	4				2	0	0	0	0	0
Nebraska	2	0	3	3	4	2	2	1	3	0	1	1
Kansas	7	4	3		2	1	3	6	4	1	2	1
SOUTH ATLANTIC												
Delaware	0	0	0				0	0	1	0	0	0
Maryland [2]	8	7	4	1		1	2	7	7	2	4	2
District of Columbia	0	2	1				0	1	1	1	1	0
Virginia	20	6	16	97	62	62	4	4	6	1	2	2
West Virginia	10	4	6		1	1	0	0	8	5	3	1
North Carolina	50	21	46				2	3	7	[3] 2	1	1
South Carolina	26	7	16	101	113	113	6	4	5	0	0	1
Georgia	31	14	26	11	7	6	1	5	5	3	0	0
Florida	6	10	7		2	2	1	8	2	1	1	0
EAST SOUTH CENTRAL												
Kentucky	9	11	11	1	1	1	9	0	4	0	4	0
Tennessee	39	12	13	6	5	12	3	3	3	3	1	1
Alabama	34	14	18	12	10	15	0	3	5	1	1	1
Mississippi [2]	25	19	13							1	1	1
WEST SOUTH CENTRAL												
Arkansas	6	6	6		21	10	5	2	2	1	1	0
Louisiana	9	13	8	34		1	4	2	3	1	2	1
Oklahoma	2	12	10	21	23	17	0	6	2	1	2	1
Texas	58	36	33	492	363	310	30	32	17	4	6	1
MOUNTAIN												
Montana	4	7	5	2	3	2	18	2	3	0	0	0
Idaho	1	0	0	1			17	1	4	0	0	0
Wyoming	0	0	0		3	3	2	1	2	0	0	0
Colorado	4	3	3	8	2	23	2	0	6	0	2	0
New Mexico	7	12	1	1			0	1	1	0	1	0
Arizona	5	1	1	4	34	30	3	2	8	1	1	0
Utah [2]	1	0	0				3	5	5	0	0	0
Nevada	0	0	0				1	0	0	0	0	0
PACIFIC												
Washington	8	8	2		1	1	49	14	11	1	2	2
Oregon	0	3	3		2	3	16	19	18	0	0	0
California	18	17	13	13	10	12	148	107	49	11	11	2
Total	467	325	336	847	695	728	540	416	626	83	122	39
38 weeks	10,217	8,077	8,926	75,069	341,582	171,545	104,125	593,495	541,518	[3] 6,578	13,729	2,623

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Corrections, week ended August 25, meningococcus meningitis: Massachusetts 2 cases (instead of 0); North Carolina 4 cases (instead of 5).

Telegraphic morbidity reports from State health officers for the week ended September 22, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944		Sept. 22, 1945	Sept. 23, 1944	
NEW ENGLAND												
Maine	9	6	1	12	24	7	0	0	0	0	0	0
New Hampshire	1	5	2	0	0	2	0	0	0	0	0	0
Vermont	5	8	2	2	0	3	0	0	0	0	0	0
Massachusetts	51	34	20	44	68	68	0	0	0	3	4	4
Rhode Island	1	1	1	5	8	4	0	0	0	0	0	0
Connecticut	11	17	10	7	9	9	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	110	383	57	82	59	85	0	0	0	4	8	11
New Jersey	55	40	17	15	21	21	0	0	0	2	2	2
Pennsylvania	48	82	14	76	56	72	0	0	0	5	7	17
EAST NORTH CENTRAL												
Ohio	37	77	34	95	71	79	0	1	0	4	8	8
Indiana	11	20	15	28	19	28	0	2	0	5	4	5
Illinois	93	38	50	62	78	73	0	0	0	5	3	9
Michigan [3]	12	75	28	40	49	58	0	0	0	3	4	8
Wisconsin	48	26	22	24	52	49	0	0	0	1	0	1
WEST NORTH CENTRAL												
Minnesota	23	45	23	26	26	26	0	0	0	1	1	1
Iowa	14	13	13	21	14	34	0	0	0	0	2	2
Missouri	9	15	10	22	35	27	0	0	0	1	6	9
North Dakota	0	3	2	6	5	4	0	0	0	0	0	0
South Dakota	1	1	1	0	1	9	0	0	0	0	1	0
Nebraska	14	3	10	16	3	7	0	0	0	2	0	0
Kansas	8	5	11	35	37	37	0	0	0	7	1	1
SOUTH ATLANTIC												
Delaware	2	8	1	2	1	1	0	0	0	0	1	1
Maryland [3]	[5] 13	31	3	22	11	14	0	0	0	5	1	4
District of Columbia	7	14	1	9	6	5	0	0	0	1	0	1
Virginia	19	48	4	32	45	28	0	0	0	7	4	10
West Virginia	3	18	6	42	44	37	0	0	0	1	6	6
North Carolina	14	23	7	48	44	62	0	0	0	2	0	6
South Carolina	6	2	2	22	6	6	0	0	0	4	5	5
Georgia	[5] 6	3	1	11	19	19	0	0	0	6	5	12
Florida	12	1	2	6	5	3	0	0	0	6	1	1
EAST SOUTH CENTRAL												
Kentucky	3	31	7	32	14	19	1	0	0	7	13	13
Tennessee	21	12	6	47	35	44	0	0	0	18	3	11
Alabama	4	1	1	18	27	27	0	0	0	3	0	4
Mississippi [3]	5	9	3	12	10	3	0	0	0	3	5	6
WEST SOUTH CENTRAL												
Arkansas	2	1	2	15	11	6	0	0	0	3	7	11
Louisiana	10	5	4	12	4	4	0	0	0	4	11	11
Oklahoma	15	2	3	8	6	6	0	0	0	5	1	7
Texas	39	5	5	56	28	19	0	0	0	17	16	17
MOUNTAIN												
Montana	7	8	2	6	5	5	0	0	0	5	0	0
Idaho	2	0	0	6	12	5	0	0	0	0	0	2
Wyoming	3	0	0	9	4	3	0	0	0	0	0	0
Colorado	11	2	4	7	10	10	0	0	0	5	2	6
New Mexico	1	1	1	7	3	3	0	0	0	8	6	4
Arizona	0	9	2	5	4	2	0	0	0	0	0	1
Utah [3]	22	0	2	3	4	4	0	0	0	0	0	0
Nevada	0	1	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	20	5	5	0	27	19	0	0	0	2	2	2
Oregon	2	12	12	14	28	6	1	0	0	0	4	1
California	54	9	9	108	80	66	0	0	0	11	3	4
Total	[5] 864	1,158	796	1,177	1,128	1,128	2	3	6	167	148	218
38 weeks	8,883	13,570	5,803	139,374	151,709	102,603	279	317	639	3,671	4,072	5,137

[3] Period ended earlier than Saturday.

[4] Including paratyphoid fever reported separately, as follows: Massachusetts 3; New York 1; Ohio 1; Indiana 1; Michigan 1; Maryland 1; Virginia 1; South Carolina 2; Georgia 1; Louisiana 1; Texas 2; New Mexico 1; California 1.

[5] Delayed reports, included in cumulative total only, poliomyelitis: Maryland, July, 1 case; Georgia, August, 8 cases.

Telegraphic morbidity reports from State health officers for the week ended September 22, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Sept. 22, 1945	Whooping cough: Week ended— Sept. 23, 1944	Whooping cough: Median 1940–44	Week ended Sept. 22, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	39	3	12	0	0	0	0	0	0	0	1
New Hampshire	0	0	2	0	0	0	0	0	0	0	1
Vermont	11	20	17	0	0	0	0	0	0	0	2
Massachusetts	138	79	123	0	0	5	1	0	0	0	1
Rhode Island	18	11	32	0	0	0	0	0	0	0	0
Connecticut	34	33	34	0	5	0	1	0	0	0	3
MIDDLE ATLANTIC											
New York	286	119	266	2	44	0	2	0	0	1	5
New Jersey	151	68	120	0	1	0	0	0	0	0	1
Pennsylvania	191	82	205	0	1	0	0	0	0	0	3
EAST NORTH CENTRAL											
Ohio	153	110	220	0	0	5	0	0	0	0	0
Indiana	20	10	18	2	0	3	1	0	0	0	1
Illinois	79	115	146	5	0	0	1	0	2	0	4
Michigan [2]	179	97	263	1	7	1	0	0	0	0	3
Wisconsin	47	145	199	0	0	0	0	0	0	0	6
WEST NORTH CENTRAL											
Minnesota	28	40	40	3	0	0	0	0	0	0	6
Iowa	3	15	21	0	0	0	0	0	0	0	3
Missouri	21	9	12	0	0	0	0	0	0	0	0
North Dakota	0	6	10	0	0	0	0	0	0	0	1
South Dakota	1	3	3	0	0	0	0	0	0	0	0
Nebraska	1	3	8	0	0	0	0	0	0	0	0
Kansas	20	19	33	0	0	0	1	0	0	0	8
SOUTH ATLANTIC											
Delaware	0	0	2	0	0	0	0	0	0	0	0
Maryland [2]	37	53	69	0	0	13	0	0	0	0	0
District of Columbia	7	1	13	0	0	0	0	0	0	0	0
Virginia	18	18	34	0	0	336	0	0	0	0	1
West Virginia	3	5	22	0	0	0	0	0	0	0	0
North Carolina	77	141	60	0	0	0	0	2	0	4	0
South Carolina	49	25	37	4	56	0	0	0	0	3	0
Georgia	15	20	16	0	3	1	0	0	2	19	4
Florida	4	29	13	1	2	0	0	0	0	7	0
EAST SOUTH CENTRAL											
Kentucky	81	58	58	0	0	0	0	0	0	0	0
Tennessee	20	32	32	1	0	2	0	0	3	3	4
Alabama	2	14	14	3	0	0	0	0	0	17	1
Mississippi [2]	------	------	--------	0	0	0	0	0	0	4	2
WEST SOUTH CENTRAL											
Arkansas	6	30	13	0	7	0	0	0	4	2	1
Louisiana	28	0	1	0	2	0	0	0	0	16	5
Oklahoma	14	7	5	0	8	0	0	4	0	0	2
Texas	127	108	108	6	690	6	0	0	1	76	7
MOUNTAIN											
Montana	8	54	23	0	0	0	0	0	0	0	0
Idaho	11	0	2	0	0	6	0	0	0	0	0
Wyoming	[7] 2	6	7	0	0	0	0	0	0	0	0
Colorado	32	10	35	0	0	0	0	0	0	0	0
New Mexico	11	3	9	0	9	3	0	0	0	0	0
Arizona	17	16	13	0	0	12	0	0	0	0	0
Utah [2]	12	20	27	0	0	0	0	0	0	0	1
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	16	11	34	0	0	0	0	0	0	0	3
Oregon	13	8	8	0	0	4	0	0	0	0	0
California	187	81	170	2	7	0	24	0	0	0	7
Total	2,217	1,737	2,722	30	842	397	31	6	12	152	87
Same week 1944	1,737	------	--------	30	561	322	19	14	11	159	56
Average, 1942–44	2,438	------	--------	35	482	248	17	[6] 4	10	[6] 146	------
38 weeks: 1945	95,586	------	--------	1,383	19,610	8,342	455	420	576	3,508	3,521
1944	71,887	------	--------	1,275	16,656	6,643	491	430	430	3,600	2,653
Average, 1942–44	118,050	------	[6] 136,936	1,235	12,809	5,995	484	[6] 427	598	[6] 2,511	------

[2] Period ended earlier than Saturday.
[6] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 15, 1945

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	1	0	------	0	1	1	1	2	0	0	0	8
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	1	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	4	0	3	14	12	0	0	22
Fall River	0	0	------	0	0	0	0	0	1	0	0	2
Springfield	0	0	1	0	0	0	1	0	2	0	0	8
Worcester	0	0	------	0	6	0	8	0	1	0	0	5
Rhode Island:												
Providence	0	0	------	0	1	0	2	0	2	0	0	13
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	2	0	0	0	0
Hartford	0	0	------	0	0	0	0	2	1	0	0	7
New Haven	0	0	------	0	0	0	1	1	0	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	0	1	0	5	8	5	0	0	8
New York	8	3	1	0	9	5	43	49	18	0	4	165
Rochester	0	0	------	0	4	0	3	10	0	0	0	21
Syracuse	0	0	------	0	0	0	0	0	1	0	0	38
New Jersey:												
Camden	0	0	------	0	1	0	1	1	0	0	0	3
Newark	0	0	------	0	1	0	0	3	2	0	1	11
Trenton	0	0	------	0	0	0	1	4	0	0	1	2
Pennsylvania:												
Philadelphia	0	0	1	0	18	1	17	25	11	0	1	101
Pittsburgh	0	0	------	0	1	0	8	10	5	0	1	6
Reading	0	0	------	0	0	1	1	1	2	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	1	0	7	0	6	0	0	5
Cleveland	1	0	1	0	1	1	8	4	7	0	0	41
Columbus	0	0	------	0	0	0	1	0	7	0	1	2
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	1	0	0	0	2
Indianapolis	2	0	------	0	1	0	6	1	3	0	0	0
Terre Haute	0	0	------	0	0	0	3	0	0	0	0	0
Illinois:												
Chicago	0	0	------	0	27	6	17	18	11	0	0	68
Springfield	0	0	------	0	0	0	2	0	0	0	0	0
Michigan:												
Detroit	4	0	------	0	13	1	6	1	12	0	0	92
Flint	0	0	------	0	8	0	0	0	1	0	0	0
Grand Rapids	0	0	------	0	0	0	0	0	1	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	[illegible]
Milwaukee	0	0	------	0	5	0	0	16	4	0	0	4
Racine	0	0	------	0	0	0	0	0	1	0	0	7
Superior	0	0	------	0	1	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	1	1	0	0	0	3	0	0	[illegible]
Minneapolis	0	0	------	0	1	0	2	15	2	0	1	[illegible]
Missouri:												
Kansas City	1	0	------	------	1	0	2	2	4	0	0	[illegible]
St. Joseph	0	0	1	------	1	1	0	0	0	0	0	[illegible]
St. Louis	1	0	------	1	1	3	5	16	6	0	1	[illegible]

City reports for week ended September 15, 1945—Continued

	Diphtheria cases	Encephalitis, infectious cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	0	0	1	15	0	0	0	1
Kansas:												
Topeka	0	0	------	0	1	0	0	0	0	0	0	8
Wichita	0	0	------	0	0	0	9	1	4	0	0	7
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	0	0	0	0	0	3
Maryland:												
Baltimore	6	0	------	0	0	0	6	2	12	0	0	33
Cumberland	0	0	------	0	0	0	0	0	2	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	2	0	2	5	4	0	0	6
Virginia:												
Lynchburg	0	0	------	0	0	0	3	0	3	0	0	3
Richmond	0	0	------	0	0	1	3	12	5	0	0	2
Roanoke	0	0	------	0	0	0	0	0	0	0	0	1
West Virginia:												
Wheeling	1	0	------	0	0	0	1	0	1	0	0	0
North Carolina:												
Wilmington	1	0	------	0	0	0	0	0	0	0	0	8
Winston-Salem	0	0	------	0	0	0	2	0	1	0	0	6
South Carolina:												
Charleston	0	0	------	0	0	0	1	0	0	0	0	0
Georgia:												
Atlanta	1	0	4	0	0	0	3	0	0	0	1	6
Brunswick	0	0	------	0	0	0	1	0	0	0	0	0
Savannah	0	0	------	0	0	1	0	0	1	0	0	0
Florida:												
Tampa	0	0	------	1	0	0	0	0	2	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	1	4	3	0	0	1	3
Nashville	0	0	------	0	0	0	3	2	0	0	0	0
Alabama:												
Birmingham	2	0	------	0	0	0	2	2	0	0	0	0
Mobile	0	0	------	0	0	0	0	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	0	0	1	0	0	0
Louisiana:												
New Orleans	5	0	------	1	0	2	8	6	2	0	2	0
Shreveport	4	0	------	0	0	0	3	1	4	0	0	0
Texas:												
Dallas	2	0	------	0	1	0	4	1	4	0	0	0
Galveston	0	0	------	0	0	0	0	0	1	0	0	0
Houston	1	0	------	0	0	1	3	3	0	0	0	0
San Antonio	1	0	1	1	0	0	4	3	3	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	2	0	0	0	0
Great Falls	0	0	------	0	0	0	0	1	1	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	1	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	2
Colorado:												
Denver	1	1	1	0	3	1	0	15	3	0	0	13
Pueblo	0	0	------	0	0	0	0	2	1	0	0	3
Utah:												
Salt Lake City	0	0	------	0	2	0	1	11	2	0	0	3

City reports for week ended September 15, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	22	0	4	2	3	0	0	10
Spokane	0	0	------	0	0	0	1	0	0	0	0	0
Tacoma	0	0	------	0	5	0	1	0	0	0	0	1
California:												
Los Angeles	1	0	5	0	9	0	2	10	15	0	1	22
Sacramento	0	0	------	0	0	1	2	1	1	0	0	11
San Francisco	1	0	------	0	19	3	8	7	5	0	1	2
Total	47	4	16	6	173	31	238	314	213	0	17	825
Corresponding week, 1944	49	------	13	6	90	------	206	------	219	0	31	650
Average, 1940–44	51	------	33	[1] 9	[2] 147	------	[1] 225	------	266	0	37	904

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York 4; Topeka 1; Baltimore 4; Spokane 2; San Francisco 1.

Dysentery, bacillary.—Cases: Buffalo 1; New York 8; Detroit 6; Lynchburg 1; Charleston, S. C. 5; Los Angeles 2.

Dysentery, unspecified.—Cases: Baltimore 3; Richmond 2; San Antonio 8.

Rocky Mountain spotted fever.—Cases: Cincinnati 1; Richmond 3.

Typhus fever, endemic.—Cases: New York 1; Charleston, S. C. 2; Atlanta 4; Savannah 6; Birmingham 4; Memphis 1; Mobile 3; New Orleans 5; Dallas 1; Houston 7; San Antonio 7; Los Angeles 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1943, 33,858,300)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	2.6	0.0	31	2.6	41.8	57.5	52	0.0	0.0	170
Middle Atlantic	4.2	1.4	0.9	0.0	16	3.2	36.5	51.4	20	0.0	3.7	165
East North Central	4.3	0.0	0.6	0.6	35	4.9	31.4	25.2	33	0.0	0.6	137
West North Central	4.5	0.0	2.3	4.5	14	9.0	42.8	110.4	43	0.0	4.5	95
South Atlantic	15.3	0.0	6.8	1.7	3	3.4	37.4	32.3	53	0.0	1.7	115
East South Central	11.8	0.0	0.0	0.0	0	5.9	53.1	41.3	0	0.0	5.9	18
West South Central	37.3	0.0	2.9	5.7	3	8.6	63.1	40.2	43	0.0	5.7	3
Mountain	7.9	7.9	7.9	0.0	40	7.9	15.9	246.2	56	0.0	0.0	167
Pacific	3.2	0.0	7.9	0.0	87	6.3	28.5	31.6	38	0.0	3.2	73
Total	7.3	0.6	2.5	0.9	27	4.8	36.8	48.5	33	0.0	2.6	127

PLAGUE INFECTION IN KERN AND SANTA CLARA COUNTIES, CALIF.

Under date of September 14, plague infection was reported proved on September 12 in tissue and fleas from ground squirrels, *C. beecheyi*, shot in Kern and Santa Clara Counties, Calif., as follows: *Kern County*—pool of 200 fleas from 13 ground squirrels shot 2 miles south and 1½ miles west of Cummings Valley School; *Santa Clara County*—pool of 400 fleas from 80 ground squirrels shot 16 miles southeast of Gilroy, and tissue from 1 ground squirrel and a pool of 200 fleas from 13 ground squirrels shot 6½ miles east and 2 miles south of Gilroy. Under date of September 17 plague infection was reported proved on September 13 in tissue from 2 ground squirrels, *C. beecheyi*, shot 16 miles southeast of Gilroy.

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended September 8, 1945.—During the 4 weeks ended September 8, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	3	Ophthalmia neonatorum	2
Cerebrospinal meningitis	1	Puerperal fever	2
Chickenpox	25	Ringworm	1
Diphtheria	62	Syphilis	246
Dysentery, unspecified	13	Tetanus	8
Filariasis	2	Tetanus, infantile	3
Gonorrhea	214	Trachoma	1
Influenza	31	Tuberculosis (all forms)	556
Leprosy	1	Typhoid and paratyphoid fever	9
Malaria	264	Typhus fever (murine)	31
Measles	13	Whooping cough	51
Mumps	2		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 1, 1945—During the week ended September 1, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox				16	34	7	13	19	9	98
Diphtheria	3	4	3	46	6	4	1			67
Dysentery:										
Amebic					2					2
Bacillary				19					6	25
Encephalitis, infectious							1			1
German measles					1	1		3	2	7
Influenza		8			14				2	24
Measles			1	18	20		2	5	5	51
Meningitis, meningococcus				1			1	1		3
Mumps				12	14	10	5	12	8	61
Poliomyelitis		3	1	7	17	1	1			30
Scarlet fever		1	4		18	12	7	12	4	58
Tuberculosis (all forms)		9	4	148	28	12	1	2	19	223
Typhoid and paratyphoid fever		1		7		2		1	1	12
Undulant fever				1	1		1	1	1	5
Venereal diseases:										
Gonorrhea	1	18	36	141	223	68	29	50	74	640
Syphilis		10	5	82	94	16	4	9	43	263
Other forms				1						1
Whooping cough		1	22	147	11	6	3	19	2	211

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Ecuador.—For the month of August 1945, plague infection was reported in Ecuador as follows: Canar Province, 2 cases, 1 death; Loja Province, 5 cases, 2 deaths.

Great Britain—Malta.—For the week ended September 8, 1945, 13 cases of plague were reported in Malta. For the week ended September 15, 1945, 5 cases of plague were reported in Malta, including 2 cases in Marsa, 2 cases in Zurrie, and 1 fatal case in Hamrun.

Italy—Sicily—Palermo.—On September 19, 1945, 4 cases of plague with 3 deaths were reported in Palermo, Sicily, Italy.[1]

Morocco (French).—For the period September 1–10, 1945, 6 cases of plague were reported in French Morocco.

Smallpox

Belgian Congo.—For the week ended August 25, 1945, 107 cases of smallpox were reported in Belgian Congo.

British East Africa.—For the week ended September 15, 1945, 91 cases of smallpox with 9 deaths were reported in Kenya, and for the week ended August 11, 1945, 160 cases of smallpox with 26 deaths were reported in Tanganyika, British East Africa.

Rhodesia, Northern.—For the week ended August 4, 1945, 638 cases of smallpox with 2 deaths were reported in Northern Rhodesia.

Typhus Fever

Algeria.—For the period August 11–20, 1945, 29 cases of typhus fever, including 3 cases in Algiers, and 1 case in Oran, were reported in Algeria.

Ecuador.—For the month of August 1945, 95 cases of typhus fever with 3 deaths were reported in Ecuador, including 43 cases with 2 deaths reported in Quito, 19 cases reported in Ibarra, and 11 cases reported in Ambato.

Morocco (French).—For the period September 1–10, 1945, 88 cases of typhus fever, including 65 cases reported in Casablanca region and 3 cases in the city of Casablanca, were reported in French Morocco.

[1] For recent report of plague in Taranto, Italy, see PUB. HEALTH REP., Oct. 5, 1945, p. 1197.

INDUSTRIAL MANGANESE POISONING[1]

A Review

This bulletin discusses the occurrence and uses of manganese, its physicochemical properties, its analytical evaluation, industrial exposure, toxicology, the treatment of manganese poisoning, the maximum permissible exposure in industry, and measures for the prevention of industrial manganese poisoning.

All the known cases of manganese poisoning which have been reported since its discovery by Couper in 1837 have been collected and tabulated through 1940. These total 353 and reference is made to the original papers describing these cases.

The great majority of reported cases of manganese poisoning have occurred in grinders of manganese ores in which the condition could be associated with the dusty work of sorting, drying, grinding, and sifting. However, manganese poisoning from manganese fume has been reported in the case of electric welders who used electrodes containing this metal.

The symptoms of industrial manganese poisoning, differential diagnosis of chronic poisoning, pathology of poisoning in man, the laboratory examinations, absorption, and elimination of manganese, and prognosis have received particular attention in this bulletin. The importance of recognition of manganese poisoning at an early stage is stressed.

A comprehensive bibliography of 201 references to the original literature is given.

[1] Industrial manganese poisoning. By Lawrence T. Fairhall and Paul A. Neal. National Institute of Health Bulletin No. 182. Government Printing Office, 1943. For sale by the Superintendent of Documents, Washington 25, D. C. Price 10 cents.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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Public Health Reports

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OPPORTUNITIES IN PSYCHIATRIC NURSING

By CLAIRE H. FAVREAU, *Assistant Director, Division of Nurse Education, United States Public Health Service*

The present demand for nurses prepared to care for psychiatric patients greatly exceeds the supply. Moreover, the present and postwar rehabilitation program will make additional inroads on this already too limited number. Nurses must be ready to meet these demands.

A recent communication from the Nursing Committee of the American Psychiatric Association indicates that approximately 47,000 registered nurses will be needed in hospitals for psychiatric patients after the war. The American Psychiatric Association recommends not less than 1 nurse to 20 patients: a considerable number of State hospitals have only one registered nurse for thousands of patients. At present the ratio of nurses to patients in non-Federal mental hospitals is 1 nurse to 135 patients.

> Dr. Karl Menninger states: "Whatever the reasons may be, at least one-third of the patients with whom the physicians of the Army, Navy, and Veterans' Administration must deal today are psychiatric patients. If one includes those cases in which the emotional features determine the occurrence of physical symptoms, you might almost double this figure." [1]

Some institutions for psychiatric patients have not been able to meet the demand for student experience because of insufficient nursing staff personnel, inadequately prepared instructional staff, and lack of housing facilities. Even with these limitations, affiliating students have been accepted. However, this experience may be of limited benefit because the educational program including clinical teaching has not been well planned and carried out. In a few instances investigated, it was learned that the educational plan for affiliates has

[1] Menninger, Karl: The future of psychiatric care in hospitals. The Modern Hospital, 60: 43-45 (May 1945).

not been cooperatively developed. It is believed that the director of the home school has a responsibility in assisting with the development of a sound program in the affiliating institutions through cooperative planning and well-defined contractual agreements. Furthermore, it is the responsibility of the director of the home school to help develop in the students a desirable attitude and understanding toward psychiatric patients and their care. This implies that directors of schools of nursing should have complete knowledge of the details of the program offered.

The place of an affiliation in psychiatric nursing in the total nursing program depends on the length of experience the student needs to have in general medical, surgical, obstetric, and pediatric nursing at the home school before affiliation. By the end of the first year, a normally well-adjusted young woman should be sufficiently capable to care for the psychiatric patient and to profit by the experience herself. When the affiliation is given early the student may make use of the principles she has learned in the further care of patients in the home, hospital, and elsewhere as she continues in nursing. If it is postponed until the last service the student may miss the opportunity for application and hence lose some of the values in the experience.

In estimating the advantages offered by the particular mental hospital selected, officials of a school of nursing should use the same standards they find appropriate in evaluating the clinical experience for other services. For example, approval by the American College of Surgeons is considered of basic importance where general surgery and medicine are taught and practiced. Approval by the American Psychiatric Association is considered essential for hospitals with psychiatric patients which offer clinical experience to student nurses. It is important that the director of nursing in the affiliating hospital be specially qualified in psychiatric nursing. All instructional and supervisory personnel should meet the standards set by the National League of Nursing Education.

After a suitable mental hospital has been selected for student experience, plans may be made for establishing the affiliation. A conference should be arranged of all persons concerned with the student program of studies and experience to make plans. Visits should be exchanged by the nursing directors and instructors of the hospitals involved, for the purpose of getting acquainted with the educational policies in effect and making mutually agreeable arrangements for the affiliation. If the services of a psychiatric nurse adviser are desired to help evaluate the quality of the clinical service offered, she should be invited to be present at these meetings and be allowed sufficient time to plan the visit.

In setting up educational programs in psychiatric nursing, it is important to estimate the costs as well as the values. Room, laundry,

and food must be provided for the students; salaries for lecturers and instructors and for residence personnel are necessary. A budget based upon the estimated maintenance and subsistence costs for graduate nurses may be found suitable. If the groups are larger than 30, the number of nurse instructors should be increased accordingly. The program is intensive and requires considerable special preparation and experience, and these factors should be considered in estimating the salary of instructors. The expense of the affiliation should be paid out of student fees. Where the receiving institution is supported by public funds and not permitted to receive fees, some method of compensation should be worked out. Student service will be beneficial to the psychiatric hospital. A cost analysis might be made to determine the monetary value of such service.

Policies for the handling of students and their problems while on affiliation should be set up jointly by the home school and the affiliating school. Such matters as medical care during illness, permission for late leave, request for leave of absence, lack of interest in the work, or failure in class work, should be taken into consideration. The status of the student should be clearly defined in order to avoid future misunderstanding.

The State Board of Nurse Examiners must approve the affiliating program before the arrangements for a contract can be completed. When this approval has been granted, the contractual agreement is entered into by persons representative of the two institutions. Information concerning the preparation of such agreements may be found in the American Journal of Nursing, November 1943 and April 1944.

The following are recommendations which may help to solve some of the existing problems:

1. Institutions accepting affiliating students should seek consultation service from experts in:
    - *a.* Developing a well-organized clinical teaching program, based on sound principles of education.
    - *b.* Organizing regular meetings of directors of participating schools with affiliating organization personnel.
    - *c.* Developing contractual agreements between the affiliating organization and the home school.
2. A study should be made of the availability of community housing facilities. It might be possible to secure dormitories, apartment houses, or family-type houses which could be converted. Consideration may also be given to reconstructing buildings within the hospital area.
3. To provide staff nurses for nursing care of psychiatric patients, more basic programs will need to include this type of experience for all students. Such programs should be well planned to prepare nurses to help meet present and future demands of both the military and civilian population. The Senior Cadet period provided for through the United States Cadet Nurse Corps program makes it possible for additional students to have psychiatric nursing experience in Federal or other institutions for psychiatric patients.

4. Every affiliating institution with an inadequately prepared instructional staff should attempt to release at least one graduate who will qualify for admission to a university offering an advanced program in psychiatric nursing. She should have at least one year's work in an advanced psychiatric nursing program.
   Other members of the instructional staff may secure additional preparation through regional workshops or intensive on-the-job courses. Such programs might be sponsored by the State Leagues of Nursing Education or the State Boards of Nurse Examiners in cooperation with the Division of Nurse Education and psychiatric nursing experts.

Programs for advanced psychiatric nursing have been offered and continue to be offered at Catholic University, Washington, D. C.; the University of Minnesota, Minneapolis, Minn.; Teachers College, Columbia University, New York, N. Y.; and Western Reserve University, Cleveland, Ohio. Plans are under way for additional programs of this type, some of which may be completed this fall. Graduate nurses will continue to be assisted through Bolton Act funds during the current fiscal year. Inquiries regarding these advanced programs should be made directly to the individual universities offering the study.

It is of interest to note that 126 postgraduate students enrolled in advanced psychiatric nursing programs in three universities have been assisted through Bolton Act funds since September 1943. This is in addition to graduate nurses enrolled in regular advanced nursing programs, which may or may not include advanced psychiatric nursing. These graduates may have had experience in psychiatric nursing as a student or a graduate nurse and are now preparing for higher positions in hospitals for psychiatric patients.

Students enrolled in these advanced programs have made valuable contributions to the basic affiliating student program in the hospitals used as a practice field for advanced psychiatric nursing.

For the fiscal year 1946, the number of schools offering psychiatric nursing experience has increased. A study of 1,107 schools in the country participating in the United States Cadet Nurse Corps program indicates that 48 percent now offer experience in psychiatric nursing to all students and an additional 11 percent to some students, making a total of 59 percent. Students in 457 schools, or 41 percent, do not receive any psychiatric nursing experience. Of the 153 institutions offering experience in psychiatric nursing, 100 institutions receive affiliating students and 53 institutions have schools of nursing which include this experience.

Through the combined efforts of the home schools and affiliating institutions, it should be possible to offer programs which will not only give students a broader experience and self-satisfaction but also an understanding of the need for psychiatric nursing. It should help

them to gain the necessary knowledge and develop the skills needed for quality care of psychiatric patients.

Such an extension in a specialized field is completely in harmony with the plans for provision of a more complete health program for the country in the postwar years.

PSYCHIATRIC NURSING EXPERIENCE BY AFFILIATION[1]

By Mary E. Corcoran, *Adviser in Psychiatric Nursing, United States Public Health Service*

For many years nurse educators have recommended experience in nursing mental patients as part of the basic nursing course (*1*). More nursing schools are seeking affiliation with mental hospitals than can be accommodated at present. Every State should provide facilities so that all nurses could have the experience. "Fifty-eight percent of the hospital beds in the country are occupied by mental patients"(*2*). Nurses need experience and patients need care. Means to bridge the gap are available. The mental hospital that establishes an educational program for student nurses by affiliation will offer a much needed service. The hospital will benefit by the improved care provided for its patients, by the stimulus that study and research programs give to personnel, and by improved public relations. Every student nurse will interpret the mental hospital as she finds it to those with whom she makes contact at home, at school, and in her community. If she has had suitable teaching and good clinical experience, the benefits will be mutually advantageous.

EDUCATION AND EXPERIENCE BY AFFILIATION

Start.—A date for starting a course in psychiatric nursing in affiliation with a mental hospital should be selected sufficiently in advance to permit directors of nursing education to change plans. Four to eight months may be needed for adequate preparation. Occasionally a selected group of students can be assembled to start at shorter notice.

Length.—Thirteen weeks is a satisfactory length of time for experience in psychiatric nursing in a basic program. A week may be spent in orientation; thereafter, three 4-week assignments or four 3-week assignments may be arranged for each student. Students have expressed preference for the longer assignments. Eight weeks for affiliation in psychiatry is shorter than is desirable. Owing to popular concepts of mental disease, students often are fearful of patients; several weeks are needed for them to adjust to the situation.

[1] From the Mental Hygiene Division, Bureau of Medical Services.

In an 8-week course, the time is up at the point where the work becomes interesting and meaningful. If the course must be as short as 8 weeks, two 4-week assignments probably will be better than shorter periods. Students say that 2 weeks is too short a time to become acquainted and at ease with mental patients.

Number.—The number of students sent by each school will depend upon its enrollment. The mental hospital accepting students will be guided by the facilities and qualified personnel which it can make available. One nurse instructor or clinical supervisor can do justice to a unit of 20 to 30 students. More than that number requires supplementary nurse supervisors or instructors.

Groups.—The number of students in each group should be kept about the same or with small variation. If groups are larger than thirty or so, the affiliating students should come at intervals. Admitting some students at monthly or 6-week intervals stabilizes the ward assignments and living-quarters routine. The number of classes in orientation and psychiatric nursing will need to be increased.

Personnel increase.—A hospital staff contemplating accepting student nurses for education in psychiatric nursing assumes an obligation. Sufficient qualified personnel should be on hand or provided. General hospitals may supply a well-qualified nurse supervisor or instructor to acquire psychiatric experience. She could then serve as a clinical instructor for affiliating students in a mental hospital. The psychiatric hospital could select a nurse who has the educational background necessary for acquisition of teaching methods at a suitable institution. She could then become a qualified instructor. Salary appropriations will be needed for nurse instructors, clinical supervisors, and residence and health directors.

The duties, responsibilities, and authority of each member of the nursing staff should be defined. Each person involved should know her particular duties and how they fit into the entire program. The status and salary assigned to the nursing director, instructors, nurse supervisors, and head nurses will indicate the value which the hospital directors place on nursing care. If nurses are considered necessary to the welfare and recovery of the patients, they are given dignified status. If less is expected of them, they are treated accordingly. It is useless to proclaim a policy of good nursing standards unless the governing board and the hospital officials support their announced policy by good personnel practice.

Equipment.—Schools should be provided with sufficient, appropriate equipment to make possible good teaching and rapid learning without extraordinary effort on the part of instructor or students. Books of reference are necessary. They should be appropriate, up to date, and in sufficient quantity to be conveniently available.

Charts, models, slides, and motion-picture films should be provided as aids to teaching. These items are of importance to students coming to a special hospital where they are expected to acquire understanding of psychiatry (a difficult subject) in a short period of time. Good teaching equipment, reading material, and reading and lecture rooms make the difference between learning and confusion, between liking and aversion.

Illness.—During the course, a student may take cold or get sunburned or fall down and hurt herself badly enough to need a day or so off duty. Agreement should be made between the sending and receiving nursing directors as to how such temporary absences will be managed. For longer absence, the law of the State concerning nurse education or the State Board of Nurse Examiners may have regulations. In that case the regulation should be known to all concerned. Usually if a student is seriously ill and can be moved safely, her home school may prefer to have her return. Mental hospitals usually have an infirmary or provide care for sick employees. If it is suitable and properly directed, the student may be as well off if she remains.

A week lost from an 8-week course, or 2 weeks out of 13, usually means that the student has lost too much teaching and experience to go on with the group. She should be permitted to return to her home school and come back with a later group. Each situation should be considered separately.

Budget and accounts.—Good business practice requires budgeting of funds. Money for the operation of a nursing school should be appropriated separately from hospital funds used for the care of patients and for hospital activities.

PRELIMINARY PREPARATIONS

Following the conferences at which agreements and policies are established, the receiving hospital is in a position to proceed. Before the students arrive, preparations should be made for class programs, as well as for rooms, meals, laundry, mail, and other personal details.

Education.—Schedules of classes in each topic should be arranged. Physicians and other instructors should be consulted so that their preferences may be considered. Classes should be held in the daytime or compensating free time planned for recreation, if some must be held at night.

The length of class periods depends upon the type of class. Lectures of 50 to 60 minutes are suitable. Demonstration classes, clinics, and laboratory classes of 90 to 120 minutes are economical of time and effort. Longer periods become tiresome and the value of the teaching effort is lost to some extent. The nursing director will probably

assign duties to each of her associates concerned with student nurse education and accommodation. The director of nursing education will plan classes, rotations, and all the details of education. She will arrange with others on the teaching staff for hours, locations, and materials. Should an instructor fail to appear at class, she should be able to arrange a substitute activity so the students' time will not be wasted. She will be responsible for keeping and completing the students' records. She should not be held responsible for residence management or social and health programs.

Instructors will be responsible for preparation and presentation of the topic they agree to present. Each one should maintain order during class. Failures should not occur. A student's inability or inattention should be noticed and counsel made available for her before it is too late to be effective.

Students should have experience, not only with the nursing care of chronic psychotic patients, but with those newly admitted, acute cases of psychosis, convalescents, and patients under active treatment. A student may not always see a patient enter the hospital and recover during her training period, but she will get a good overview by observing a number of patients being admitted, during progress, and at recovery.

Lecturers and instructors.—Psychiatrists should conduct the classes having to do with psychiatry and should conduct clinics at which patients are presented. Social workers should teach sociology as it relates to mental disease. Occupational therapists, recreation directors, physiotherapists, and dietitians should be placed on the schedule of classes.

An affiliation involves repetition of the lectures about four times a year. If the instructor is required to repeat the lectures too frequently he may become disinterested. Senior psychiatrists or other well-prepared instructors might divide the classes and plan for alternates in order that all of the objectives may be attained. It is preferable that the psychiatrists or other special lecturers be compensated. Full-time nurse instructors should be employed for formal and informal teaching. The clinical and classroom topics may be divided in such a way that each nurse instructor teaches some classes and spends some time on the wards. It may be desirable for instructors to alternate classroom teaching and clinical supervision with each group of students admitted.

Nurse instructors.—Psychiatric nursing is the major topic for student nurses. Nurse instructors should be qualified by experience in psychiatry and by preparation in teaching methods to present the topic convincingly. The nurse instructor should attend some of the classes given by other instructors so that she may correlate material to the advantage of the students.

Payment.—Physicians and others who are asked to conduct classes for student nurses in addition to their full-time duties should be paid for their effort. Preparation for classes, arranging illustrative material, and reading notebooks require time and effort. Instructors should be provided with the materials they require for demonstration.

Living conditions.—Student nurses should be provided with adequate living quarters under the supervision of a qualified residence director. A matron should be on duty in the evening until all students are in the house for the night. Students out with late permission should not have to wait for someone to come from another building to let them in. Graduate nurses should not be burdened in their off-duty hours with responsibility for students unless they are employed for that purpose.

Students should have an opportunity for recreational activities at proper hours without disturbing others. Transportation to shops, recreation centers, and churches should be available without excessive expense or delay. Provision should also be made for laundering lingerie. Analysis of frequent complaints of misdemeanors committed by students indicated that the violations of residence rules concerned noise, food, and laundering. When provision is made for these normal needs the difficulties are reduced.

Residence directors should be informed in plenty of time that the students are coming. In planning the day and hour groups are to come, the residence director should be consulted. A specific day in the week may be selected for the starting date of the affiliating program and may be found more convenient than if students come at the beginning or end of a month. From a housekeeping point of view, group changes are inconvenient over week ends. An entrance date should be selected when the housekeeping personnel, porters, and others needed for help with the moving and housework are available. Forty or more residents leaving rooms after the noon meal and a different group due for supper presents a gigantic task to the housekeeping staff. Plans for rooms and service in the dining room should be made before the students arrive.

Hospitals vary according to local custom in their methods for quartering students. If the method works satisfactorily in the situation, it has merit.

Final responsibility.—The nursing director is finally responsible for the educational program and welfare of the students as well as for the standard of nursing care maintained for patients.

Students' records showing class attendance, experience, grades, health, and personality estimate should be prepared from class books, ward reports, and other sources. The educational director should check the records and prepare them for the signature of the nursing director.

The nursing director depends upon her associates for accuracy and promptness in preparing and sending records. She may need to review the circumstances of a report of failure on the ward or in residence routine. It should be understood and agreed that students coming for affiliation are adults and that they should not need special discipline while they are away from their home schools. The nursing director may need to consult with the director of a student's home school concerning illness, absence for valid reason, or other such items. If a student fails to adjust sufficiently, which seldom happens, or is too immature to direct her own program and behavior, which occasionally happens, she should be asked to return to her home school after arrangements have been made for her to go.

The home school should accept responsibility for disposal of the problems and for arranging the student's return with a group later if feasible.

Counsel.—Psychiatric nursing may confront the student with problems which she needs help in solving. Opportunity to consult a mental hygiene clinic or a psychiatrist for personal guidance is helpful. An announcement of who may be consulted, where, and when, should be included in the general information provided during orientation. Students should be given to understand that such consultation is a usual routine the same as reporting a cold or other indisposition.

Occasionally a problem of behavior arises. Class and educational problems should be dealt with by the instructor and educational director. Ward problems should be dealt with by the charge nurse and nursing supervisor and residence affairs by the matron on duty and the residence director.

If the ward and residence problems are more complicated than the persons concerned can manage, the educational director or clinical instructor may advise if they are requested to do so.

Instructors and educational and nursing directors should offer the students help with their difficulties. The student should go on the wards secure in her belief that she is surrounded by well-disposed, experienced nurses who are desirous of helping her acquire ability in caring for patients having mental illnesses.

If the affiliation is successful, the student benefits personally by her experience in the mental hospital. She should obtain insight into her problems and become better adjusted and more efficient. The patients she cares for in general hospitals or in their homes, when she is a graduate nurse, will benefit by her increased understanding of their emotional problems. Her family and friends should find her more companionable because of her increased poise and dependability. The community in which she lives should benefit by her ability to understand the problem of caring for mental patients. She can be

an effective mental hygienist if she becomes a public health nurse, helping patients and their families maintain emotional equilibrium in times of stress.

The final test of effectiveness of the affiliation is the return of the affiliating nurses to psychiatric nursing either to the hospital where they had their experience, or elsewhere.

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PATHOLOGY OF EXPERIMENTAL TULAREMIA IN THE GOLDEN HAMSTER (*CRICETUS AURATUS*)[1]

By R. D. Lillie, *Senior Surgeon,* and Carl L. Larson, *Passed Assistant Surgeon, United States Public Health Service*

The gross and microscopic pathology is described from a series of 25 hamsters derived from the experiments of Larson (*1*).

Intraperitoneal inoculations of 0.3 cc. of a 10^{-6} dilution of the above "T–500" suspension were made in 16 hamsters. Four were injected subcutaneously and 1 intramuscularly with 0.3 cc. of dilutions varying from 10^{-1} to 10^{-7}. Two received intranasal instillations of 0.3 cc. of a 10^{-2} dilution and 2 were inoculated intracerebrally with 0.03 cc. of 10^{-2} and 10^{-6} dilutions, respectively.

The animals were killed or died at the following intervals: 2 on the first day, 3 on the second, 4 each on the third and fourth, 10 on the fifth, and 2 on the seventh day after inoculation.

GROSS LESIONS

Grossly, inoculation lesions were not dissociated from the local inguinal lymph node reaction in the four animals inoculated by the

[1] From the Pathology Laboratory and the Division of Infectious Diseases, National Institute of Health.

subcutaneous route. In Nos. 12, 18, and 19, the inguinal node was enlarged, hemorrhagic, and necrotic, and adjacent tissue was adherent. In No. 25, necrosis of the site of injection was noted, and in No. 23 there was swelling, hemorrhage, and necrosis at the site of intramuscular injection.

Clear to turbid exudates were present in the abdo ninal and chest cavities in many of the intraperitoneally inoculated animals, more often in the peritoneum than pleura, and also in 2 hamsters inoculated subcutaneously. Pleural exudate was present in 9 animals, 8 dying on the fifth day and 1 on the third. Peritoneal fluid was present in 15 animals, 1 on the second day, 4 on the third, 2 on the fourth, and 8 on the fifth. Fibrinous exudates on omentum and surfaces of liver and spleen were present only after intraperitoneal injection and only on the third to fifth days, appearing in 9 animals in all.

Swelling and hemorrhage in Peyer's patches of the intestine appeared in 5 animals dead on the third to fifth days. Focal necroses were seen in the liver in 10 and in the spleen in 11 animals, chiefly on the fourth to seventh days.

Focal hemorrhage or hemorrhagic consolidation of the lungs was noted in 10 hamsters, dead 1 each on the second, third, and fourth days, 6 on the fifth, and 1 on the seventh.

Enlargement of the spleen was noted in nine animals dead, two on the fourth, five on the fifth, and two on the seventh day. These nine animals were inoculated, four by the subcutaneous route, two by the intraperitoneal route, and one each by intracerebral, intranasal, and intramuscular routes. Six of the remaining seven animals dead on the fourth, fifth, and seventh days were inoculated intraperitoneally, and five of these showed copious fibrin exudates on the spleen capsule. Only hamster No. 21 killed 5 days after intraperitoneal inoculation showed both splenic enlargement and capsular exudation.

SITE OF INOCULATION

Histologic study was made of the site of the subcutaneous or intramuscular inoculation in four hamsters (Nos. 12, 18, 23, and 25), killed on the fourth, fifth, sixth, and seventh days. The first of these showed cytoplasmic oxyphilia of the epidermis, few focal hemorrhages in the papillary layer of the derma, focal lymphocyte infiltration of derma and subcutaneous fat with many clusters of coccoid organisms and irregular karyorrhexis, and an area of necrosis involving the deeper layers of the derma, the skin muscle, and subcutaneous tissue. In this area of necrosis there were fibrin exudation, hemorrhage, and much nuclear debris. Fibers of the skin muscle were intensely oxyphil and karyolytic. Lymphatic vessels near the regional node were filled

with nuclear debris and blood vessels contained hyaline and necrotic cellular thrombi.

In the second animal the process was similar, but mammary gland tissue was also included and exhibited extensive coagulative to caseous necrosis, and organisms were few or absent in most of the lesion. The third, inoculated intramuscularly, showed extensive caseous and coagulative necrosis of fascia and muscle, centering about arteries. In the fourth there was a small area of coagulation necrosis of the epidermis overlying a larger area of caseous necrosis of derma and subcutis in which the coagulated fibers of the skin muscle remained recognizable.

The primary lesions studied in man have usually represented later phases of a basically similar process, complicated by secondary infection. Such primary skin lesions apparently did not develop in jack rabbits or mice. Cottontails showed more organisms and less local destruction, while in ground squirrels large hemorrhagic coagulated lesions developed, and similar lesions have been reported in guinea pigs and sheep.

LYMPH NODES

Mesenteric and axillary lymph nodes were routinely sectioned. Frequently the latter were so small that only fat and muscular tissues appeared in the sections. Inguinal nodes as well were taken in the four animals inoculated subcutaneously.

Both grossly and microscopically the inguinal and axillary nodes of animals inoculated subcutaneously showed more severe lesions than did axillary nodes of animals infected by other routes. Enlargement, congestion, hemorrhage, and necrosis were recorded grossly, extensive karyorrhexis to caseous necrosis of the nodes, and caseous lymphangitis in adjacent tissues microscopically. In such nodes no great numbers of organisms were identified.

Mesenteric nodes were more prone to show sinus dilatation than axillary, but this tendency seems common as a relatively normal anatomical difference in rodents. Lymphoid follicles often presented pale centers with phagocytic reticulum cells ingesting more or less nuclear debris. While significant of cell destruction, this finding may appear in uninfected rodents, and was seen in two hamsters killed 1 day after inoculation. No other changes appeared in animals killed 3 days or less after inoculation.

The two hamsters that died on the third day showed focal hemorrhage in mesenteric node sinus areas, with reticuloendothelial swelling and clusters of coccoid organisms in their cytoplasm. Erythrophagia was present also in one, slight focal karyorrhexis in the other. A single focal necrosis with karyorrhexis, reticulum cell swelling, and clusters of intra- and extracellular coccobacillary organisms appeared in an axillary node of one of these two hamsters.

In animals dying or killed later essentially similar lesions appeared, but karyorrhexis was often more extensive and more advanced, so that in some nodes there was diffuse caseous necrosis of pulp, follicles, and sinus areas. Generally changes were more advanced in sinus areas. Pulp sometimes presented hyaline thrombi with clusters of small coccoid organisms in small blood vessels.

Generally similar changes are observed in tularemic lymph nodes in all species. Fibrin exudation, seen in some other species, is inconspicuous in most of these hamsters. Similar reduction of number of evident organisms in the presence of extensive necrosis is seen in jack rabbits, cottontails, and cotton rats showing many organisms in surviving reticuloendothelium. White mice and some guinea pigs also showed many organisms.

SPLEEN

Six animals killed during the first 3 days after inoculation showed only moderate pulp congestion and slight to moderate pulp lymphocyte infiltration, less often a rather marked myelosis with large myeloid cells, nórmoblasts, and a few megakaryocytes. Beginning with animals dying on the third day, and in three of the four killed on the fourth day, lesions were constantly present, with the exception of hamsters Nos. 11 and 22, which showed no lesions, gross or microscopic, in any of their organs.

The first observed changes were colonization of the more or less swollen pulp reticuloendothelium by clusters of small coccoid organisms, a patchy hyaline thrombosis of the pulp, with clusters of organisms also in the thrombus material and karyorrhexis of the included cells. This graded into dense accumulations of fragmented nuclei, among which organisms seemed less numerous than in marginal surviving tissue. Fibrin is seldom apparent in these focal lesions. Such areas of necrosis were usually present and often involved splenic follicles as well. Surviving follicles not infrequently presented swollen phagocytes with ingested nuclear fragments along their lymph clefts, and clusters of organisms were sometimes present in these phagocytes as well.

Vague borders of foamy epithelioid cells around sharply defined foci of necrosis were suggested in two hamsters killed on the fourth and fifth days. Otherwise, splenic lesions were essentially similar to those seen in acute tularemia in jack rabbits, cottontails, cotton rats, and mice. The sharply defined focal necrosis of Belgian hares, guinea pigs, and man are infrequent. In a naturally infected hamster Dwijkoff noted a diffuse, partly focal necrosis with fibrin in the spleen.

HEART

In hamster No. 12 (4 days) a mass of hyaline thrombus containing red corpuscles, clumps of nuclear fragments, and clusters of coccoid

organisms was present in the atrioventricular orifice in contact with a leaflet of the tricuspid valve. Otherwise, rather pronounced atrial dilatation was noted in four hamsters, congestion of ventricular muscle in three, and focal epicardial lymphocyte infiltration in two.

According to Lillie and Francis, intrinsic cardiac lesions have been absent in 13 human autopsies, 2 quail, 4 cotton rats, 3 ground squirrels, 3 mice, and 3 foxes. In 1 man interstitial lymphocyte infiltration was noted. In Belgian hares acute tularemia gave focal lesions in 1 of 28, while in subacute infections 20 percent of the hares had cardiac focal lesions. Focal necrosis of heart muscle occurred in 3 of 9 rats and 1 of 10 guinea pigs and clumps of organisms were found in hyaline thrombi or swollen endothelial cells in both of 2 cottontail rabbits.

LUNG

Lung tissue from 24 hamsters was studied. No lesions were seen in Nos. 1, 4, 7, and 23, killed on the first, second, third, and fifth days, and occasional focal hemorrhages were the only lesions in Nos. 2, 6, 11, and 22, killed on the first, second, fourth, and fifth days. Congestion, hemorrhage, and edema were noted in No. 3, which died on the second day. In No. 10, killed on the fourth day, the only finding was parasitization of scattered intraseptal cells by clumps of small coccoid organisms, while in No. 13, also killed on the fourth day, two foci of septal karyorrhectic necrosis containing few coccoid organisms were the only lesions. One similar focal septal necrosis was seen in one other hamster.

In the remainder, capillary or venous thrombi, usually both, were observed. Capillary thrombi were commonly hyaline and often contained clumps of small coccoid to bacilliform organisms. Similar organisms occurred also in scattered intraseptal cells, and less often in evident alveolar lining cells. The venous thrombi were composed of hyaline material, of masses of nuclear debris, and of entrapped red corpuscles, and also contained clusters of organisms. They often showed prolongation into small tributary veins when they did not completely occlude the lumen. Often unclotted blood occupied part of the vein lumen beside the thrombus, but even lobar veins were sometimes completely occluded.

In 8 of the 12 cases with venous thrombosis more or less extensive alveolar hemorrhage was observed, and in 3 of these 8 there was also slight to marked hemorrhage in the periarterial spaces. This hemorrhage is regarded as probably obstructive in etiology. In 1 of the 4 cases of venous thrombosis without hemorrhage densely basophilic masses in the thrombi were observed (fifth day). The basophilic material occurred as coarse, intensely basophilic granules and lobate masses. These stained black with iron chloride hematoxylin, dark

blue with an alizarin red S,[2] toluidin blue sequence, were iron negative, and unstained by alizarin red S alone.

For tularemia this propagation of the otherwise common capillary thrombi into pulmonary veins with resultant venous occlusion and extensive alveolar and lymphatic hemorrhage appears to be unique in this species. Hyaline capillary thrombi and clusters of organisms in septal cells as well as thrombi have been reported also in jack rabbits, cottontails, cotton rats, mice, and occasional guinea pigs (Lillie and Francis).

PLEURA AND PERICARDIUM

Consistently with the lack of appreciable reaction in the peritoneum when other than the intraperitoneal route of inoculation was used, and with the previously reported findings in other experimental animals (Francis generally employed cutaneous or subcutaneous or oral routes of infection), histologic lesions of the pulmonary pleura and of the epicardium were absent. Serous pleural exudates were noted grossly in one 3-day hamster and in eight of the ten 5-day animals. Focal lymphocyte infiltration and focal hemorrhage in mediastinal fat were noted in one hamster each. Three showed necrosing mediastinal lymph nodes similar to those seen in the abdomen at similar stages.

PERITONEUM

Grossly, serous peritoneal exudation appeared as early as the second day in one of two intraperitoneally inoculated hamsters, and was present in all intraperitoneally inoculated animals that survived 3 days or longer. Fibrinous deposits on the viscera were observed in the two intraperitoneally inoculated animals which died on the third day, but not in those killed, and were present in three of the four animals killed 4 days after intraperitoneal inoculation and in all six of those dead 5 days after intraperitoneal inoculation.

Serous exudation was observed also in two hamsters killed 5 days after subcutaneous inoculation, but fibrinous exudates were not seen in any of the nine animals infected by other than the intraperitoneal route.

Histologically the fibrinous exudate was found on the splenic omentum, the capsules of the liver and spleen, less often and less marked on the serosae of the intestine, tube, and epididymis. In addition to the animals in which reactions were grossly evident, focal reactions were seen on the testicular capsule 1 day after intraperitoneal injection, in one hamster killed 3 days after intraperitoneal inoculation on the omentum and mesentery, and on the liver capsule in an animal killed on the seventh day.

[2] Stain 1 hour in 1 :1,000 aqueous solution, rinse and counterstain 30 seconds in 1 :1,000 toludin blue. Dehydrate and clear with acetone and xylene in sequence.

The exudate consisted of fibrin and necrosing cells. These were commonly unidentifiable from karyorrhexis, but sometimes lymphocytes, red corpuscles, and neutrophil leucocytes were identifiable. Often numerous clusters of more or less densely packed coccoid organisms were present, both free and in cells.

Beneath this exudate were often seen swollen mesothelial cells, some of which were packed with organisms. In omental and mesenteric tissues there was commonly a thick layer of underlying nuclear debris, sometimes surviving lymphocytes, monocytes, and neutrophil leucocytes. Mast cells were readily identified both in surviving and necrotic areas, and were readily distinguished from the numerous clusters of coccoid organisms occurring free and in monocytoid cells in the exudate. Necrosis was perhaps less frequent in the earlier animals, recognizable cells in the later.

Beneath capsular exudates on the liver there were sometimes increased numbers of liver cells packed with organisms.

ESOPHAGUS

No lesions were observed in 7 hamsters, and no specific lesions were reported by Lillie and Francis in 3 men, 19 guinea pigs, 9 rats, 5 ground squirrels, 2 cotton rats, or 1 cottontail rabbit.

INTESTINE

Grossly, swelling, hemorrhage, and often necrosis were observed in the agminated lymphoid follicles of Peyer in the small intestine in five hamsters.

Small intestine was studied histologically in 15 hamsters, colon in 8. There were no lesions of the colon. Small intestine was recorded as normal in 13 sections from 10 hamsters, but in 2 of these lesions were present in other levels, making a total of 7 showing lesions. These lesions usually involved the lymphoid follicles, less often the adjacent mucosa. Follicles generally were quite active, with moderate phagocytosis of nuclear debris by the reticuloendothelium of the lymph clefts, which also contained free nuclear fragments in some. Follicular hemorrhage was present in 2 animals, extending into submucosa in both and mucosa in 1, accompanied by hyaline capillary thrombi in the mucosa and follicles in both. In 3 other animals there were mucosal foci of coagulation necrosis of stroma in which there were numerous hyaline eosinophilic globules about the size of lymphocytes. Associated with these there were swollen mucosal reticulum cells sometimes apparently ingesting the globules. Clumps of small coccoid organisms were found in 5 cases, occurring in swollen mucosal reticulum cells adjacent to focal lesions and in hyaline thrombi. In 2 hamsters serosal mesothelial cells were swollen and packed with

organisms. Diffuse karyorrhexis of lymphoid tissue was noted in 1 hamster.

Focal necroses in intestinal mucosa have been noted previously in one cottontail, two guinea pigs, five Belgian hares, two men, one ground squirrel, and in the lymphoid follicles in cotton rats. Organisms were seen in and near lesions in cottontails and cotton rats.

LIVER

As in the spleen, lesions were constant on the fourth to seventh days, except for the apparently uninfected hamsters Nos. 11 and 22, and appeared in the two which died on the third day.

Almost regularly there are seen more or less numerous scattered isolated coagulated and necrotic liver cells. Their cytoplasm is strongly oxyphil, their nuclei absent or in varying phases of karyolysis. Infrequently they contain clusters of small coccoid and short bacillary organisms. Such clusters of organisms are more often seen in surviving, basophilic liver cells, occurring in 11 of the 16 animals in which lesions were present. These bacterial clusters are more often loose and small, but in 5 hamsters numbers of cells were solidly filled with closely packed coccoid organisms. Such cells were sometimes more numerous just beneath the fibrinocellular capsular exudate seen in some animals.

Hyaline and necrosing cellular capillary thrombi were also a frequent lesion, and again often contained clusters of organisms. Such thrombi graded into small foci of karyorrhectic necrosis and also formed part of the foci of mixed coagulative and karyorrhectic necrosis.

Focal necroses were sharply defined, ranging from small cell clusters up to 50μ in diameter, less often larger, perhaps to 500μ in an occasional animal. Some were purely coagulative, some composed of coagulated liver cells with karyorrhectic thrombus between, some solidly karyorrhectic in whole or in part with admixture of one of the preceding types in part of their area, and a few showed conversion of cells and vessels into concentric fibrinoid masses enmeshing numbers of intact erythrocytes as well as clusters of organisms. In a few animals vague, or less often definite, borders of epithelioid cells appeared around focal necroses. Most of these occurred in killed animals rather than in those that died of the infection.

Compared with certain other infections, fatty changes in liver cells are relatively inconspicuous. Fine fat droplets occur in some cells, not in others, sometimes accumulated in the perinuclear zone of cytoplasm, and then more common in the periportal zones of the lobules. Kupffer cell fat phagocytosis appeared in a few hamsters, and some showed diffuse sudanophilia of vascular serous contents.

Dwijkoff (1930) noted fatty infiltration, capillary endothelial swelling, and desquamation, thrombi of coccoid organisms, and miliary

necrobiotic foci in the liver of a naturally infected hamster (*Cricetus* sp.).

There is much similarity between the foregoing picture and that seen in cottontail rabbits and jack rabbits, less with that in cotton rats and in white mice.

PANCREAS

This organ was studied in 12 hamsters, of which 5 showed focal lesions of liver and spleen. Of these 5, one showed irregular interstitial lymphocyte infiltration. In the rest there were no lesions.

This accords with the absence of focal lesions in 15 men, 2 cottontail rabbits, 1 cotton rat, 4 mice, 7 rats, 1 ground hog, 3 foxes, and 1 dog, and the single lesions in single animals noted in series of 55 Belgian hares, 11 guinea pigs, 1 ground squirrel, and 1 opossum reported by Lillie and Francis.

ADRENAL

Adrenals were studied histologically in 15 hamsters. No lesions were observed in the 9 dead before the fifth day. The 5 dying on the fifth day, and the 1 dying on the seventh all showed few to numerous oxyphil, coagulated, and necrotic isolated cortex cells, and 4 of them showed more or less extensive interstitial cortical hemorrhage. Hyaline thrombi and clumps of coccoid organisms were less often seen in the cortex, and endothelial parasitization was seen in both cortex and medulla in 1 hamster only.

Hemorrhages have been reported in cotton rats, isolated necrotic cortex cells in jack rabbits, hyaline thrombi with organisms in jack rabbits and cottontails, endothelial parasitization in mice, guinea pigs, and cottontails. Cortex cell parasitization as seen in jack rabbits, mice, and cottontails was lacking in this species, as were the well-defined focal necroses of Belgian hares, jack rabbits, ground squirrels, rats, guinea pigs, and water rats (Lillie and Francis).

KIDNEY

Kidney was studied histologically in 20 hamsters. As in the liver, fatty changes were relatively infrequent and slight, perhaps more in collecting and loop tubules than in convoluted. More frequent and more striking was an accumulation of fine fat droplets in interstitial and glomerular capillary endothelium. This was noted in 7 animals, involving glomeruli in 6, interstitial capillaries in 5. In the 6 hamsters with glomerular fat deposits, and in 6 others there was noted a diffuse sudanophilia of the blood plasma in larger vessels as well as capillaries.

Intratubular casts were noted in 13 animals, usually hyaline and oxyphil, sometimes epithelial in nature. Few blood casts were seen in 2 animals, and hemoglobin casts in one of these. In a few animals

there was slight to rather extensive necrosis of convoluted tubule epithelial cells.

A single focus of karyorrhectic necrosis was noted in the renal cortex in hamster No. 12 (4 days). Hyaline thrombi in isolated glomerular loops, usually with clusters of small coccoid organisms in the thrombus or in adjacent cells, appeared in 5 of 11 animals dead on the fourth and fifth days. In one hamster dying on the seventh day there was extensive deposition of material resembling amyloid in many glomeruli. Few foci of karyorrhectic necrosis of isolated glomerular loops were observed in one other hamster killed on the fifth day.

Clusters of coccoid organisms, though usually restricted to glomeruli, occasionally appeared in the endothelium of intertubular capillaries.

Similar glomerular thrombi and bacterial clusters are reported in white and gray mice, cottontails, fewer jack rabbits, guinea pigs, cotton rats, ground squirrels, probably in Dwijkoff's water rats, and in one quail. Focal necrosis is infrequent also in other species, including man, guinea pigs, Belgian hares, ground squirrels, and water rats (Lillie and Francis, literature).

TESTIS AND EPIDIDYMIS

Active spermatogenesis was noted in four hamsters (fourth, fourth, fifth, seventh days), tubular degeneration or atrophy in four others (first, first, second, and fifth days). Normal epididymis was noted in all eight and in one other. There were no focal lesions. The foci of capsular exudate observed in four hamsters are discussed with the peritoneal reaction.

Lillie and Francis noted degeneration but no focal lesions in eight human cases and three guinea pigs, no lesions in two cottontail rabbits and one California ground squirrel. Focal hemorrhage in the polar fat and in the testis were noted respectively in two other ground squirrels. One guinea pig had a periorchitis.

OVARY, TUBE, AND UTERUS

In hamster No. 8 a corpus luteum showed coagulation necrosis of moderate numbers of isolated lutein cells, and small clumps of lutein and endothelial cells packed with small coccoid organisms. In one other ovary there was hemorrhage in a corpus luteum, but no other changes suggesting a tularemic focal lesion. The other seven ovaries studied were normal.

In hamster No. 14 there was endometrial engorgement with much focal hemorrhage, moderate numbers of small hyaline thrombi, and moderately numerous clumps of coccoid organisms in thrombi, in endothelial cells, and in endometrial stroma cells. In four other animals the uterus was normal, though there was an organizing parametrial thrombophlebitis in a hamster 3 days after inoculation.

Tubes from 12 hamsters showed no intrinsic focal lesions, though serosal reactions as a part of a general peritoneal process were seen in 2.

References to studies of female internal genitalia are almost absent from the literature. Lillie and Francis include references to the uterus in two women, ovary in one, tubes and adnexa in two ground squirrels, and ovary and tubes in one mouse. No lesions were recorded.

BRAIN

Sections of brain from the two intracerebrally inoculated hamsters showed no lesions. These were dead 2 and 4 days, respectively, after inoculation.

SUMMARY

Acute tularemia in hamsters is characterized by extensive necrosis, hemorrhage, and fibrin exudation at the site of inoculation, producing local sloughs after subcutaneous injection, and fibrinous peritonitis with intraperitoneal inoculation. There are hyaline and necrosing cellular capillary thrombi containing clusters of organisms in liver, kidney, lung, lymph nodes, adrenals, and elsewhere. There is coagulation necrosis of isolated cells in adrenal cortex and liver parenchyma, and a focal mixed karyorrhectic and coagulative necrosis is seen in the liver. Focal sinus thrombosis grading into karyorrhexis and caseous necrosis occurs in spleen and lymph nodes and spreads to involve pulp and follicles generally. In the lung there is venous thrombosis with secondary alveolar and periarterial hemorrhage. Loose to dense clusters of coccoid and bacillary *P. tularensis* occur in liver cells, in peritoneal mesothelial cells, in capillary endothelial cells, and in reticuloendothelial cells in spleen, lymph nodes, lungs, intestines, and liver. Organisms are fewer in necrotic than in marginal surviving areas.

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NUMBER OF VACANCIES FOR FULL-TIME PUBLIC HEALTH PERSONNEL IN STATE AND LOCAL HEALTH DEPARTMENTS, JULY 1945

The Surgeon General's Committee on Postwar Training of Public Health Personnel, which consists of representatives of the United States Public Health Service, the Conference of State and Territorial Health Officers, the Association of Schools of Public Health and the American Public Health Association, has sponsored a survey of the

Number of vacancies[1] for full-time public health personnel reported in 38 State and 930 local health departments in 42 States, July 1945

State	Health officer	Epi-demi-ologist	Other M. D.	Gradu-ate nurse	Sani-tary or public health engi-neer	Sani-tarian	In-spec-tor	Veter-inarian	Den-tist	Statis-tician	Health educa-tor	Nutri-tion-ist	Bac-teriolo-gist, serolo-gist	Chem-ist	Lab-oratory techni-cian	X-ray tech-nician	Dental hygi-enist	V. D. inves-tigator	Medi-cal social worker
	Type of position																		
Total	99	31	208	1,313	110	212	113	24	38	47	50	26	98	26	105	50	15	11	17
Alabama	3	1	2	29	3	14	2	3	1	0	1	0	17	0	3	0	----	0	1
Arizona [1]	1	----	2	8	0	4	----	0	----	1	0	0	1	----	1	1	----	1	----
Arkansas [2]	0	0	2	1	0	6	1	0	0	0	1	0	0	1	0	1	----	0	----
California	1	2	24	96	4	32	21	1	2	8	1	6	3	1	8	1	2	0	2
Colorado	1	----	2	11	1	2	1	0	0	0	1	1	0	1	1	0	----	----	----
Connecticut	0	2	2	7	2	3	2	0	0	0	0	0	2	0	0	0	1	----	----
Delaware [2]	1	1	1	5	2	0	1	0	----	0	0	0	0	----	1	----	----	----	----
District of Columbia [2]	0	0	6	26	0	15	----	0	2	0	0	1	0	0	7	1	7	----	5
Florida [4]	4	0	0	17	0	3	3	0	1	0	0	----	----	----	2	1	----	0	----
Georgia	13	1	14	57	17	7	5	1	1	1	2	1	2	1	15	8	0	----	0
Idaho [2]	1	1	1	17	0	0	----	----	----	0	0	0	0	0	----	----	----	1	1
Illinois [4]	0	1	1	7	1	1	0	0	1	1	2	0	0	----	0	----	----	0	----
Indiana [2]	0	0	3	132	15	11	3	----	1	2	5	1	2	3	2	3	----	----	1
Iowa	0	0	0	19	0	2	0	0	0	0	0	0	0	0	0	0	----	----	----
Kansas [2]	2	0	5	11	4	1	0	1	0	0	1	0	3	2	1	1	0	2	----
Kentucky [2]	18	0	3	71	2	13	0	0	3	0	0	1	0	1	4	3	----	0	----
Maine [4]	0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Maryland	2	0	10	35	5	8	13	1	0	3	1	3	3	1	0	0	----	----	2
Massachusetts [4]	3	0	1	3	----	1	2	0	2	0	2	1	1	1	3	0	0	----	2
Michigan	9	1	3	159	3	4	19	5	3	1	5	2	8	2	10	1	----	0	0
Minnesota [4]	1	0	0	5	1	0	2	0	0	----	0	----	0	0	1	0	----	----	----
Mississippi [4]	0	----	1	25	0	6	----	0	----	----	0	----	0	----	0	0	1	----	----
Missouri	11	2	8	55	8	5	6	0	4	2	0	0	0	1	3	1	1	----	----
Montana	1	0	2	13	0	0	1	----	1	0	0	1	0	0	0	1	----	----	----
Nebraska [4]	3	----	----	4	----	0	----	----	----	----	----	----	----	----	----	----	----	----	----
Nevada [2]	0	0	----	----	0	0	----	----	0	----	----	----	----	----	----	----	----	----	----
New Hampshire	0	0	2	0	0	0	0	0	0	0	----	0	0	0	0	----	0	----	----
New Jersey	0	0	5	2	2	0	3	2	0	1	0	0	2	0	3	0	----	----	----
New Mexico	0	0	1	19	0	0	----	----	----	0	----	2	0	----	1	2	----	1	----
New York [2]	0	10	35	181	2	12	12	4	0	17	4	3	18	2	21	4	0	----	----

North Carolina	5	1	13	29	3	15	2	0	1	1	3	0	2	3	2	1	----	0	----
Ohio	0	0	16	45	4	8	2	5	1	3	2	1	1	2	1	0	0	0	----
Oklahoma [2]	1	2	10	28	1	8	1	1	1	1	4	0	0	0	2	1	----	5	----
Oregon	0	1	1	12	0	1	0	----	1	0	1	0	0	0	0	0	----	----	----
Pennsylvania [4]	0	0	3	5	0	0	1	0	0	0	0	----	0	0	0	1	----	----	----
Rhode Island	0	0	0	2	1	1	0	0	0	0	----	0	0	0	0	0	0	----	----
South Carolina	0	0	1	9	0	1	0	0	1	1	2	0	0	----	1	0	----	0	----
South Dakota [3]	1	1	1	19	0	0	----	----	1	----	0	----	1	----	----	0	----	0	----
Tennessee [2]	0	0	4	15	10	4	3	----	0	3	4	1	17	1	----	6	3	----	1
Texas	4	1	5	35	2	5	0	0	1	0	1	0	8	1	2	1	0	1	----
Utah	2	1	1	21	1	2	----	0	1	0	1	0	2	0	0	0	----	----	----
Vermont [2]	0	----	0	0	0	----	0	----	0	----	1	0	0	0	----	0	----	----	----
Virginia [2]	4	0	5	26	11	7	3	0	8	0	1	1	3	1	6	8	----	0	----
Washington	2	0	3	17	1	3	1	0	0	1	2	0	1	0	2	2	----	----	1
West Virginia	3	0	3	10	1	3	0	0	0	0	1	0	1	0	0	----	----	0	----
Wisconsin	2	1	6	16	3	4	3	0	0	0	0	0	0	1	1	1	0	----	1
Wyoming [2]	0	1	0	9	0	0	----	----	----	0	1	0	0	0	1	----	----	----	----

[1] A zero indicates that there are no vacancies; dashes indicate that there are no positions of the particular type in the State.
[2] Complete returns.
[3] State health department only.
[4] Local health departments only.

personnel of State and full-time local health departments. The purpose of the survey was to obtain complete and accurate information on the number of existing positions, both filled and vacant, in order to appraise the opportunities and openings in the field of public health.

Copies of the survey questionnaire were sent to all State health departments and to all local health departments listed in the 1945 Directory of Full-time Local Health Officers. Returns have been received from 38 State and 930 local health departments. This represents about 80 percent returns. No questionnaires at all were received from Louisiana and North Dakota. Three States, Indiana, Nevada, and Tennessee returned only the questionnaires for their State health departments.

The accompanying table shows the number of vacancies reported for 19 types of public health personnel, by State. In addition, 144 vacancies were reported for "other technical" and unspecified types of personnel. The figures shown do not include approximately 2,000 positions, vacant or filled by temporary appointees, which are held for persons in the armed services.

DEATHS DURING WEEK ENDED SEPTEMBER 22, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 22, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,205	8,027
Average for 3 prior years	8,049	
Total deaths, first 38 weeks of year	341,548	343,526
Deaths under 1 year of age	607	567
Average for 3 prior years	608	
Deaths under 1 year of age, first 38 weeks of year	23,051	23,476
Data from industrial insurance companies:		
Policies in force	67,310,855	67,291,680
Number of death claims	11,633	11,846
Death claims per 1,000 policies in force, annual rate	9.0	9.2
Death claims per 1,000 policies, first 38 weeks of year, annual rate	10.2	10.1

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED SEPTEMBER 29, 1945

Summary

The incidence of poliomyelitis declined for the second consecutive week. A total of 774 cases was reported, as compared with 864 last week and 962 for the next earlier week, 976 for the corresponding week last year, and a 5-year (1940–44) median of 679. Declines occurred in each of the 9 geographic divisions except the West North Central.

Of the 21 States reporting 10 or more cases each, 7 recorded an increase of 37 cases (161 to 198), while in 12 States a decline of 82 cases occurred (from 534 to 452). States reporting 15 or more cases each are as follows (last week's figures in parentheses): *Increases*—Pennsylvania 52 (48), Michigan 19 (12), Wisconsin 56 (48), Minnesota 26 (23), Iowa 23 (14); *decreases*—Massachusetts 39 (51), New York 108 (110), New Jersey 47 (55), Ohio 36 (37), Illinois 71 (93), Texas 36 (39), Utah 15 (22), California 52 (54). The total to date for the country as a whole is 9,657, as compared with 14,546 last year, 9,309 in 1943, and a 5-year median of 6,394, for the corresponding periods.

The seasonal low for meningococcus meningitis has been reached and increased incidence of the disease may now be expected. A total of 101 cases was reported currently, as compared with 83 last week, 127 and 192, respectively, for the corresponding weeks of 1944 and 1943, and a 5-year median of 48. States reporting the largest numbers are New York 12, Pennsylvania and Missouri 10 each, and California 7. The total to date is 6,679, as compared with 13,856 and 14,523, respectively, for the corresponding periods of the epidemic years of 1944 and 1943, and a 5-year median of 2,671.

Ten cases of anthrax were reported for the week—8 in Pennsylvania and 1 each in Massachusetts and California.

Of the 17 diseases included in the following tables, the cumulative totals for only the following are above the respective figures for the corresponding period last year (approximate percentages of excess in parentheses): Diphtheria (28), the dysenteries combined (19), Rocky Mountain spotted fever (0.01), tularemia (33), whooping cough (33), undulant fever (17).

Deaths recorded during the week in 93 large cities of the United States totaled 8,380, as compared with 8,205 last week, 7,993 for the corresponding week last year, and a 3-year (1942–44) average of 8,280. The total to date is 349,928, as compared with 351,519 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended September 29, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944	
NEW ENGLAND												
Maine	0	0	0	-------	-------	-------	0	0	1	0	0	1
New Hampshire	0	0	0	-------	-------	-------	0	0	0	0	0	0
Vermont	1	0	0	-------	-------	-------	2	1	3	0	0	0
Massachusetts	7	1	2	-------	-------	-------	37	30	53	2	5	3
Rhode Island	0	0	0	14	6	-------	1	3	3	0	1	1
Connecticut	0	1	2	-------	-------	1	2	6	6	2	4	1
MIDDLE ATLANTIC												
New York	14	6	9	(1)	[1] 1	[1] 4	12	15	48	12	14	5
New Jersey	2	3	3	3	1	2	12	10	27	1	6	3
Pennsylvania	9	5	10	-------	1	1	53	20	51	10	17	4
EAST NORTH CENTRAL												
Ohio	22	8	8	5	7	5	4	6	22	4	7	0
Indiana	8	7	8	10	3	4	3	2	4	5	1	0
Illinois	3	6	8	1	-------	3	33	15	18	5	12	1
Michigan [2]	26	7	5	-------	-------	-------	38	7	38	3	6	1
Wisconsin	0	3	2	14	5	27	22	40	48	4	2	0
WEST NORTH CENTRAL												
Minnesota	6	9	2	-------	-------	1	4	3	4	1	0	0
Iowa	2	6	6	-------	-------	-------	0	0	2	2	0	0
Missouri	8	1	3	-------	2	1	1	0	3	10	2	1
North Dakota	0	2	2	1	-------	-------	0	0	4	0	0	0
South Dakota	3	4	4	-------	-------	-------	1	1	1	0	0	0
Nebraska	1	0	1	-------	-------	-------	1	5	5	0	0	0
Kansas	10	4	4	-------	-------	2	7	4	5	0	3	1
SOUTH ATLANTIC												
Delaware	0	0	0	-------	-------	-------	0	2	2	0	0	0
Maryland [2]	17	2	3	-------	-------	2	1	0	7	2	2	2
District of Columbia	0	0	0	-------	1	-------	0	1	1	0	0	0
Virginia	13	11	16	148	72	53	7	0	16	6	2	3
West Virginia	6	6	6	-------	2	2	0	0	2	0	1	1
North Carolina	82	24	46	-------	3	2	6	4	9	1	1	0
South Carolina	20	17	25	166	202	171	8	29	15	0	2	2
Georgia	24	10	25	3	6	20	4	2	5	2	1	0
Florida	1	12	6	4	3	4	0	0	1	3	0	1
EAST SOUTH CENTRAL												
Kentucky	22	5	12	-------	2	2	5	1	2	3	1	0
Tennessee	54	14	19	14	4	7	9	5	5	4	2	1
Alabama	25	39	29	15	4	4	8	2	7	2	6	0
Mississippi [2]	21	20	10	-------	-------	-------	-------	-------	-------	-------	4	0
WEST SOUTH CENTRAL												
Arkansas	16	4	12	10	27	23	3	4	3	2	0	0
Louisiana	13	7	6	26	2	2	1	0	1	1	3	2
Oklahoma	4	4	9	17	25	11	0	2	2	0	0	0
Texas	46	52	34	625	451	379	34	24	15	5	5	2
MOUNTAIN												
Montana	1	0	0	2	5	1	63	1	14	0	0	0
Idaho	0	0	0	3	-------	-------	37	0	2	0	0	0
Wyoming	0	2	0	-------	1	1	0	1	1	0	0	0
Colorado	6	6	4	14	15	16	2	5	8	1	1	1
New Mexico	3	5	3	5	2	-------	2	6	1	0	0	0
Arizona	1	0	1	12	16	36	0	2	5	0	0	0
Utah [2]	2	0	0	-------	-------	-------	4	3	3	0	0	0
Nevada	0	0	0	-------	-------	-------	0	0	0	0	0	0
PACIFIC												
Washington	6	8	4	-------	-------	1	65	9	9	1	3	3
Oregon	1	1	1	-------	4	5	10	23	22	0	2	2
California	26	30	17	3	15	15	110	110	75	7	11	6
Total	532	352	425	1,115	888	888	612	404	668	101	127	48
39 weeks	10,749	8,429	9,374	76,184	342,470	172,013	104,737	593,899	542,892	6,679	13,856	2,671

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended September 29, 1945, and comparison with corresponding week of 1943 and 5-year median—Continued

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944		Sept. 29, 1945	Sept. 30, 1944	
NEW ENGLAND												
Maine	2	1	1	12	15	6	0	0	0	0	0	0
New Hampshire	2	4	0	4	2	1	0	0	0	0	0	0
Vermont	2	1	0	2	3	2	0	0	0	0	2	1
Massachusetts	39	22	15	63	64	68	0	0	0	3	7	7
Rhode Island	3	0	0	1	4	3	0	0	0	1	0	0
Connecticut	11	10	10	16	6	13	0	0	0	2	7	1
MIDDLE ATLANTIC												
New York	108	366	52	99	73	93	0	0	0	11	7	16
New Jersey	47	52	9	22	21	31	0	0	0	3	2	2
Pennsylvania	52	52	13	93	77	80	0	0	0	9	10	16
EAST NORTH CENTRAL												
Ohio	36	63	42	99	110	93	0	1	0	10	7	9
Indiana	8	16	10	23	29	25	0	1	0	2	0	2
Illinois	71	37	37	68	81	81	1	0	0	2	4	13
Michigan [2]	19	46	26	61	59	59	0	0	0	16	3	4
Wisconsin	56	12	12	36	43	57	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	26	32	16	30	26	28	1	0	0	0	0	0
Iowa	23	9	9	19	20	26	0	0	0	0	18	1
Missouri	12	19	19	35	17	19	0	0	0	3	5	7
North Dakota	0	1	1	5	3	3	0	0	0	1	0	0
South Dakota	7	1	1	3	5	5	0	0	0	0	1	0
Nebraska	6	4	8	5	15	12	0	0	0	2	0	0
Kansas	8	7	9	44	30	30	0	0	0	0	1	2
SOUTH ATLANTIC												
Delaware	1	7	2	4	1	2	0	0	0	2	0	1
Maryland [2]	[4] 12	29	3	29	33	18	0	0	0	1	5	7
District of Columbia	8	9	1	9	9	10	0	0	0	0	2	1
Virginia	11	23	8	70	25	25	0	0	0	17	2	8
West Virginia	5	18	4	63	58	45	0	1	0	1	4	15
North Carolina	[4] 7	18	8	55	37	18	0	0	0	4	3	3
South Carolina	2	3	3	13	9	12	0	0	0	3	6	6
Georgia	1	3	2	16	13	26	0	0	0	4	2	4
Florida	12	4	2	2	9	5	0	0	0	2	6	4
EAST SOUTH CENTRAL												
Kentucky	3	24	7	34	28	35	0	0	0	3	1	6
Tennessee	12	6	6	42	36	47	0	0	0	6	3	12
Alabama	8	4	2	16	23	26	0	0	0	6	7	7
Mississippi [2]	4	9	1	8	7	9	0	0	0	4	4	3
WEST SOUTH CENTRAL												
Arkansas	3	1	1	18	6	4	2	0	0	5	5	5
Louisiana	1	4	4	16	9	6	0	0	0	2	3	5
Oklahoma	6	2	2	4	10	10	0	0	0	3	3	4
Texas	36	7	4	85	34	22	0	0	0	12	13	13
MOUNTAIN												
Montana	10	5	3	7	8	10	0	0	0	1	1	1
Idaho	2	0	0	7	15	10	0	0	0	2	2	2
Wyoming	2	0	1	1	1	1	0	0	0	0	0	0
Colorado	4	4	2	8	11	11	0	0	0	0	1	1
New Mexico	0	0	1	6	3	1	0	0	0	6	2	6
Arizona	1	2	1	4	5	2	0	0	0	1	0	1
Utah [2]	15	0	1	11	11	7	0	0	0	0	0	1
Nevada	0	1	0	0	------	0	0	0	0	0	0	0
PACIFIC												
Washington	13	8	8	22	29	21	0	0	0	0	2	2
Oregon	5	12	5	9	16	10	0	0	0	0	1	1
California	52	18	17	109	104	72	0	0	0	0	2	7
Total	774	976	679	1,408	1,253	1,270	4	3	3	150	155	213
39 weeks	[4] 9,657	14,546	6,394	140,762	152,962	104,359	283	320	640	3,821	4,335	5,350

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever cases reported separately, as follows: Massachusetts, 3; New York, 2; New Jersey, 2; Michigan, 15; Oklahoma, 2; Texas, 1.

[4] Poliomyelitis: North Carolina, week ended Sept. 15, 4 cases (instead of 5); Maryland, 1 August case, delayed report, which is included in the cumulative total only.

Telegraphic morbidity reports from State health officers for the week ended September 29, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended—Sept. 29, 1945	Whooping cough: Week ended—Sept. 30, 1944	Whooping cough: Median 1940–44	Week ended Sept. 29, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	57	4	16	0	0	0	0	0	0	0	0
New Hampshire	6	12	2	0	0	0	0	0	0	0	0
Vermont	11	5	9	0	0	0	0	0	0	0	0
Massachusetts	114	52	104	0	0	0	0	0	0	0	0
Rhode Island	20	19	28	0	0	0	0	0	0	0	0
Connecticut	22	27	31	0	4	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	316	197	224	7	27	0	5	0	0	0	3
New Jersey	156	70	118	1	0	3	0	0	0	1	1
Pennsylvania	142	109	173	1	0	0	0	0	0	1	0
EAST NORTH CENTRAL											
Ohio	107	138	138	0	0	2	0	0	0	0	0
Indiana	13	6	21	1	0	5	1	0	0	0	0
Illinois	82	72	145	5	0	0	0	0	3	0	12
Michigan [1]	88	60	193	3	1	0	0	0	0	0	6
Wisconsin	69	106	187	1	0	0	0	0	0	0	4
WEST NORTH CENTRAL											
Minnesota	11	37	38	0	0	0	1	0	0	0	2
Iowa	1	2	21	0	0	0	0	0	0	0	4
Missouri	24	24	23	0	0	0	1	0	2	0	2
North Dakota	5	4	22	0	0	0	0	0	0	0	0
South Dakota	5	4	4	0	0	0	0	0	0	0	0
Nebraska	4	0	7	0	0	0	0	0	0	0	1
Kansas	8	28	28	0	0	0	1	0	0	1	5
SOUTH ATLANTIC											
Delaware	4	2	3	0	0	0	0	0	0	0	0
Maryland [1]	52	47	64	0	0	8	0	0	0	0	0
District of Columbia	13	1	6	0	0	0	0	0	0	0	0
Virginia	41	11	45	0	0	298	0	5	0	0	0
West Virginia	12	10	10	0	0	0	0	0	0	0	0
North Carolina	54	150	103	0	2	0	0	4	1	3	0
South Carolina	43	62	39	1	40	0	0	0	1	8	0
Georgia	3	6	10	0	2	1	0	2	0	43	6
Florida	1	1	5	2	0	0	0	0	0	7	1
EAST SOUTH CENTRAL											
Kentucky	52	24	33	2	1	0	0	0	0	0	0
Tennessee	14	19	21	0	0	1	2	0	0	1	1
Alabama	11	16	16	4	0	0	1	1	0	21	2
Mississippi [1]	------	------	------	0	0	0	0	0	0	3	0
WEST SOUTH CENTRAL											
Arkansas	15	28	20	2	29	0	0	0	2	0	1
Louisiana	2	5	5	2	0	0	0	0	1	29	0
Oklahoma	5	2	3	0	5	4	0	5	0	0	1
Texas	124	157	117	12	337	50	0	0	1	46	19
MOUNTAIN											
Montana	5	10	10	0	0	0	0	0	0	0	0
Idaho	10	0	2	0	0	0	0	0	0	0	1
Wyoming	3	10	6	0	0	0	0	0	1	0	2
Colorado	27	14	19	1	0	0	0	0	0	0	0
New Mexico	7	0	18	0	10	2	0	0	0	0	0
Arizona	3	2	9	0	0	18	1	0	0	0	1
Utah [1]	11	21	21	0	0	0	0	0	1	0	2
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	16	14	36	0	0	0	0	0	0	0	1
Oregon	6	24	19	0	0	0	0	0	0	0	1
California	155	64	202	4	3	0	15	0	0	2	6
Total	1,950	1,676	2,450	49	461	392	28	17	13	166	86
Same week, 1944	1,676	------	------	26	478	236	18	3	14	142	85
Average, 1942–44	2,153	------	------	36	409	210	14	[5] 4	10	[5] 93	------
31 weeks, 1945	97,536	------	------	1,432	20,071	8,734	483	437	589	3,674	3,607
1944	73,563	------	------	1,301	17,134	6,879	509	433	444	3,742	3,085
Average, 1942–44	120,203	------	[5] 139,386	1,270	13,218	6,205	497	[5] 433	608	[5] 2,587	------

[1] Period ended earlier than Saturday.
[5] 5-year median, 1940–44.

Anthrax: Massachusetts, 1; Pennsylvania, 8; California, 1. *Leprosy:* Illinois, 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 22, 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	4	2	2	0	0	2
New Hampshire:												
Concord	0	0	------	0	0	0	1	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	2	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	5	2	6	30	8	0	1	23
Fall River	0	0	------	0	1	0	2	0	5	0	0	0
Springfield	0	0	------	0	2	0	0	0	2	0	0	1
Worcester	0	0	------	0	6	0	5	0	1	0	0	8
Rhode Island:												
Providence	0	0	------	0	1	0	1	0	1	0	0	16
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	1	2	0	0	0
Hartford	0	0	------	0	0	0	1	1	1	0	0	1
New Haven	0	0	------	0	0	0	1	0	1	0	0	13
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	2	6	2	0	0	13
New York	6	2	2	0	4	8	40	34	23	0	3	131
Rochester	0	0	------	0	0	1	4	15	1	0	0	9
Syracuse	0	0	------	0	0	0	2	0	7	0	0	22
New Jersey:												
Camden	0	0	------	0	0	0	2	1	0	0	0	4
Newark	0	0	1	0	5	1	1	5	2	0	1	17
Trenton	0	0	------	0	0	1	1	3	0	0	0	1
Pennsylvania:												
Philadelphia	0	0	2	0	10	1	20	14	19	0	3	102
Pittsburgh	1	0	1	1	0	0	4	7	10	0	0	10
Reading	0	0	------	0	1	0	2	0	1	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	0	1	4	4	1	0	0	8
Cleveland	0	1	------	0	1	2	1	5	13	0	0	29
Columbus	3	0	------	0	0	0	2	1	12	0	2	6
Indiana:												
Fort Wayne	0	1	------	0	0	0	3	0	0	0	0	0
Indianapolis	2	0	------	0	1	1	2	0	5	0	1	6
South Bend	0	0	------	0	0	0	0	1	1	0	0	5
Terre Haute	1	0	------	0	0	0	1	0	1	0	0	0
Illinois:												
Chicago	0	0	------	0	25	0	20	19	14	0	1	47
Springfield	0	0	------	0	0	0	1	0	0	0	0	7
Michigan:												
Detroit	3	0	------	1	7	1	3	1	18	0	1	75
Flint	0	0	------	0	5	0	2	1	0	0	0	3
Grand Rapids	0	0	------	0	0	0	1	0	2	0	1	1
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	0	0	0	0
Milwaukee	0	0	------	0	5	0	0	16	4	0	0	10
Racine	0	0	------	0	3	0	0	0	0	0	0	7
Superior	0	0	------	0	0	0	0	0	0	0	0	1
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	1	1	2	0	0	0
Minneapolis	1	0	------	0	1	0	0	12	5	0	0	4
St. Paul	0	0	------	0	1	0	4	3	2	0	0	15
Missouri:												
Kansas City	4	0	------	0	1	0	5	1	6	0	0	8
St. Joseph	0	0	------	0	0	1	0	0	2	0	0	0
St. Louis	0	1	2	0	0	2	6	11	2	0	0	13

City reports for week ended September 22, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	0	0	0	0	0	0	0	0
Nebraska:												
Omaha	1	0	------	0	1	0	0	2	2	0	0	0
Kansas:												
Topeka	0	0	------	0	0	0	3	0	0	0	1	0
Wichita	0	0	------	0	1	0	1	0	1	0	0	4
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	0	0	0	0	0	0
Maryland:												
Baltimore	8	0	1	1	1	1	3	2	3	0	0	21
Cumberland	0	0	------	0	0	0	0	0	0	0	0	3
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	1	4	7	9	0	1	7
Virginia:												
Lynchburg	0	0	------	0	0	0	1	0	1	0	0	0
Richmond	0	0	------	0	1	0	2	18	9	0	0	2
Roanoke	0	0	------	0	0	0	0	0	1	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	1	0	0	0
Wheeling	0	0	------	0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	1	1	0	0	0	0
Wilmington	2	0	------	0	0	0	1	0	4	0	2	4
Winston-Salem	0	0	------	0	0	0	0	0	1	0	0	2
South Carolina:												
Charleston	0	0	------	0	0	0	0	1	0	0	0	0
Georgia:												
Atlanta	0	0	1	1	0	0	2	1	1	0	0	0
Brunswick	0	0	------	0	0	0	0	0	2	0	0	0
Savannah	0	0	1	1	0	0	0	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	1	1	1	9	0	4	0	0	8
Nashville	0	0	------	0	0	0	1	2	4	0	0	0
Alabama:												
Birmingham	0	0	2	0	0	0	1	1	2	0	2	1
Mobile	2	0	------	0	0	0	2	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	1	0	2	0	0	0
Louisiana:												
New Orleans	0	0	1	1	0	0	3	7	5	0	0	1
Shreveport	1	0	------	0	0	0	1	0	0	0	0	0
Texas:												
Dallas	3	0	------	0	0	0	0	0	9	0	0	1
Galveston	2	0	------	0	0	0	2	0	0	0	0	0
Houston	5	0	------	0	0	1	3	2	3	0	1	1
San Antonio	1	0	1	1	1	0	2	1	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	3	0	0	0	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	1
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	1	0	0	0	1	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	2	0	2	0	5	5	2	0	2	16
Pueblo	0	0	------	0	0	0	1	0	0	0	0	4
Utah:												
Salt Lake City	1	0	------	0	1	0	1	6	2	0	0	3

City reports for week ended September 22, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	11	1	4	2	1	0	0	2
Spokane	0	0	1	0	2	0	1	0	1	0	1	1
Tacoma	0	0	------	0	4	0	0	2	1	0	0	0
California:												
Los Angeles	5	0	2	0	8	1	1	14	13	0	2	26
Sacramento	0	0	------	0	5	0	1	0	0	0	0	12
San Francisco	1	0	1	0	49	2	6	6	8	0	0	3
Total	57	5	21	8	175	30	219	278	273	0	27	741
Corresponding week, 1944	68	------	15	5	90	------	223	------	273	0	26	526
Average, 1940–44	56	------	37	[1] 11	[2] 153	------	[1] 236	------	302	0	35	907

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: Boston, 2; New York, 1; Chicago, 1; Detroit, 3; Memphis, 1; Los Angeles, 2.

Dysentery, bacillary.—Cases: New Haven, 2; New York, 10; Syracuse, 1; Philadelphia, 1; Detroit 1; Baltimore, 3; Charleston, S. C., 16; Los Angeles, 1.

Dysentery, unspecified.—Cases: Baltimore, 6; Richmond, 4; San Antonio, 5.

Rocky Mountain spotted fever.—Cases: Richmond, 1.

Typhus fever, endemic.—Cases: New York, 1; Wilmington, N. C., 1; Atlanta, 6; Brunswick, 1; Savannah, 1; Nashville, 2; Birmingham, 6; Little Rock, 1; New Orleans, 1; Shreveport, 6; Dallas, 1; Houston, 3; San Antonio, 9.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,276,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	2.6	0.0	0.0	0.0	44	5.2	54.9	88.9	63	0.0	2.6	167
Middle Atlantic	3.2	0.9	2.8	0.5	9	5.6	36.1	39.3	30	0.0	3.2	143
East North Central	6.1	1.2	0.0	0.6	29	3.0	24.3	29.2	43	0.0	3.6	125
West North Central	11.9	2.0	4.0	0.0	10	6.0	39.8	59.7	44	0.0	2.0	88
South Atlantic	17.0	0.0	5.1	5.1	3	3.4	23.8	50.9	54	0.0	5.1	66
East South Central	17.7	0.0	11.8	5.9	6	5.9	76.7	17.7	65	0.0	11.8	53
West South Central	34.4	0.0	5.7	5.7	3	2.9	34.4	28.7	57	0.0	2.9	9
Mountain	15.9	0.0	15.9	0.0	24	0.0	63.5	111.2	32	0.0	23.8	191
Pacific	9.5	0.0	6.3	0.0	125	6.3	20.6	38.0	38	0.0	4.7	70
Total	8.7	0.8	3.2	1.2	27	4.6	33.4	42.4	42	0.0	4.1	113

PLAGUE INFECTION IN PLACER COUNTY, CALIF.

Under date of September 21, plague infection was reported proved on September 20 in a pool of 54 fleas from 9 ground squirrels, *C. beecheyi*, shot 1½ miles north of Tahoe, Placer County, Calif., in the Tahoe National Forest.

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 8, 1945.—During the week ended September 8, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		6	42	4	10	13	14	90
Diphtheria		3	2	12	7	6	1	1		32
Dysentery, bacillary				1	1				2	4
German measles					7			1	3	11
Influenza		2			3				1	6
Measles			1	13	36		18	13	45	126
Meningitis, meningococcus			1	2	1				1	5
Mumps				10	14	8	2	13	8	55
Poliomyelitis		3		6	[1] 21	1	6	2	11	[1] 50
Scarlet fever		3	10	35	32	3		6	9	98
Tuberculosis (all forms)		5	7	77	50	6	1	17		163
Typhoid and paratyphoid fever				13				1	3	17
Undulant fever				3	2					5
Venereal diseases:										
Gonorrhea		20	9	106	163	60	40	42	69	509
Syphilis		8	4	117	61	9	10	7	25	241
Other forms				1						1
Whooping cough		14		224	24	3	8	4	11	288

[1] Includes 2 cases, delayed reports.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Typhus Fever

Greece—Athens and Piraeus.—For the month of August 1945, 69 cases of endemic typhus fever with 1 death were reported in Athens and Piraeus, Greece.

Yellow Fever

Gold Coast—Tamale.—For the week ended September 15, 1945, one fatal case of suspected yellow fever was reported in Tamale, Gold Coast.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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LONG-RANGE DISPERSAL OF *ANOPHELES QUADRIMACULATUS*[1]

By Don E. Eyles, Curtis W. Sabrosky, and John C. Russell,
United States Public Health Service

During the summer of 1944 the attention of the writers was directed to an unusual and perhaps unique situation in which the dispersal of *Anopheles quadrimaculatus* to exceptional distances appeared to be taking place. This was at the Santee Reservoir in South Carolina where mosquito densities in the territory surrounding the impoundment were being studied in relation to location of breeding in the impoundment itself. Because of the importance of the flight habits of mosquitoes in connection with control activities, an attempt was made to determine experimentally whether or not the mosquitoes found at these exceptional distances actually could have come from the reservoir. Flights greater than 1 mile, of course, have previously been demonstrated or suspected and a recent review of the literature on this subject has been published by the senior author (*5*). Since that summary gives the historical background of anopheline flight and dispersal it will not be repeated here. However, for comparative purposes, table 1 presents pertinent data from the literature on *A. quadrimaculatus*, including data from this experiment.

In relation to the significance of the findings reported herein it should be pointed out that for the past twenty-five or more years the control of *A. quadrimaculatus* has been based upon the premise that 1 mile is usually the maximum effective flight range of this malaria vector. That such procedure is, in the main, sound is not open to question. In reviewing the work of the Office of Malaria Control in War Areas of the United States Public Health Service, which, in

[1] From Malaria Control in War Areas, States Relations Division. The work upon which this paper is based was a part of the Santee-Cooper Survey conducted jointly by the South Carolina State Board of Health and the U. S. Public Health Service, Office of Malaria Control in War Areas. The writers are indebted to the Malaria Investigations Laboratory, Memphis, Tenn., for the loan of the equipment used. The senior author is now assigned to the National Institute of Health, the junior authors to the South Carolina State Board of Health.

TABLE 1.—*Review of experiments on the flight range of* A. quadrimaculatus *(adapted from Eyles and Bishop (6))*

Year	Investigators	Number of marked mosquitoes released	Number of marked mosquitoes recaptured	Percent recaptured	Number examined for markings	Distance of recovery (miles)
1917	LePrince and Griffitts	700	4	0.57	1,542	0.53–1.06.
1917	LePrince and Griffitts	[1] 270	3	1.11	?	0.58.
1919	Geiger, Purdy, and Tarbett	4,000	10	.25	19,000	0.75–1.0 (1 at 1.0; 9 at 0.75).
1939	Carpenter	3,000	8	.27	?	0.67 (5 over 0.5).
1941	Smith, Watson, and Crowell	3,800	6	.16	415	0.07–0.5.
1943	Eyles and Bishop	16.500	32	.19	15,000	2.0–2.5 (1 at 2.5; 2 at 2.25).
[2]		3,500	21	.60	40,863	2.05–3.63 (1 at 3.63; 2 at 2.7).

[1] Experiment undertaken to determine ability of *A. quadrimaculatus* to cross a body of water.
[2] Present experiment.

cooperation with State health departments, has successfully controlled malaria-carrying mosquitoes in the extracantonment zones of several hundred war establishments, Bradley and Hanson (*1*) report that, in all but a small percentage of instances, satisfactory low densities were maintained without controlling breeding beyond the 1-mile zone around the protected area. They state that in most cases, when trouble developed, a resurvey of the mile-wide protective zone disclosed previously undetected breeding places and only under very unusual conditions was it necessary to expand the control zone.

The Santee Reservoir, located in the old Santee River swamp in Coastal Plain South Carolina about halfway between Columbia and Charleston, extends 37 miles southeast from the confluence of the Congaree and Wateree Rivers. The surrounding country was originally mostly a sandy pineland but a great part is now used in cotton cultivation. Population is scattered but reported malaria rates have been very high.

Preimpoundment treatment (maximum pool level was first reached in September 1942) consisted in part of the clearing of a zone 1 mile wide at the edge of the reservoir in the lower portion (downstream from U. S. Highway 15) and a zone one-half mile wide at the edge of the reservoir in the upper portion (fig. 1). Thus the center of the reservoir over most of its length is filled with a dense stand of dead trees, together with considerable floatage, in water from a few inches to many feet deep (fig. 2). This growth, which will henceforth be referred to as the flooded swamp, constitutes about 47,000 acres of the total of 97,000 acres in the Santee Reservoir.

Investigation proved that in the upper portion of this flooded swamp there was widespread breeding of *A. quadrimaculatus*. Extensive dipping for larvae showed that breeding was intense even in situations two or more miles from the nearest good source of blood. Adult densities around this upper portion were very high even at distances up to a mile or more from the 75-foot contour, which is

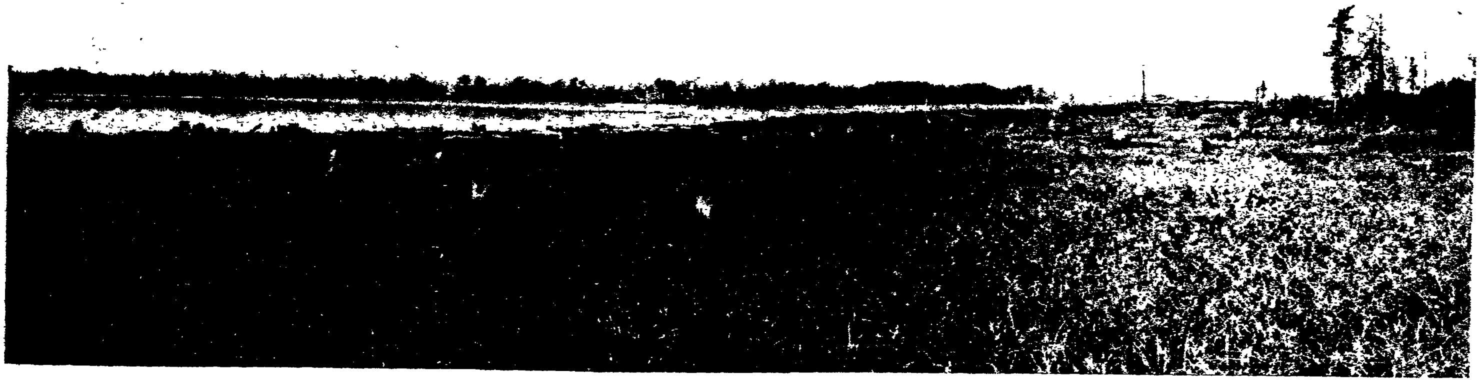

FIGURE 1.—Panorama showing the flooded swamp, the half-mile cleared zone, and, on the extreme right, the beginning of the highland (Santee Reservoir, S. C.).

FIGURE 2.—A concentration of floatage in the flooded swamp, Santee Reservoir, S. C.

normal maximum water level. Counts at the few stables within one-quarter mile of the water ranged up to 5,300 female *quadrimaculatus,* and index stations that were over 1 mile from the 75-foot contour still had recorded counts as high as 275.

Because the flooded swamp appeared to be the major source of mosquitoes the question arose as to the extent of flight of *A. quadrimaculatus* to resting places well over a mile away.

METHOD OF STUDY

For the experimental study an area was chosen in which the following conditions existed:

1. Heavy breeding in the central flooded swamp.
2. In general no appreciable breeding in the marginal cleared half-mile zone. The situation finally selected was almost dry on the northeast side except for a slough along the bluff (henceforth to be known as the Clarendon side), and consisted of open water on the southwest (henceforth to be designated the Calhoun side). The dry Clarendon side was largely filled by an island (fig. 3).
3. No local breeding above the normal high-water level from which adults could invade the study area.
4. An ample number of easily accessible catching stations with high adult counts.
5. Most of the nearest available blood meals are some distance from the major breeding areas. The distribution of these can be noted from the map (fig. 3). All the Calhoun-side stations were located over a mile from the 75-foot contour or more than 1.5 miles from the nearest point of the heavy central breeding. The Clarendon stations were situated somewhat closer but still mostly at a great distance from the principal breeding. All but one of the Calhoun stations were over 3.0 miles from the center line of the flooded swamp; all on the Clarendon side were over 2.0 miles.
6. Easy access to the center of the flooded swamp, via the old channel of the Santee River.
7. Although not strictly a necessary factor in a study of dispersal as such, malaria has long been a problem in the area of the flight experiment. On the Clarendon side, a house-to-house blood-smear survey in October 1944, in connection with the Santee-Cooper survey, demonstrated a malaria prevalence of 7.5 percent out of 253 people examined in that vicinity.

The technique and the mechanical catching equipment used in the experiment were those described by Eyles (*4*). The supply of mosquitoes for release was caught from resting places in the experimental area. These mosquitoes were almost wholly freshly engorged or gravid, the percentage of males and unfed females being negligible. Approximately 4,000 females, the number being based on estimates made before catching each station, were caught from stations 2, 3, 4, 5, 6, 7, and 9 during the morning of September 4. These were immediately dusted with aluminum powder and placed in a large cage. The cage was carried by motorboat to the predetermined release point in the center of the submerged swamp (R on map), and the mosquitoes were released at about 3 p. m. on a shady island near some hollow trees in which they were observed to take shelter. With

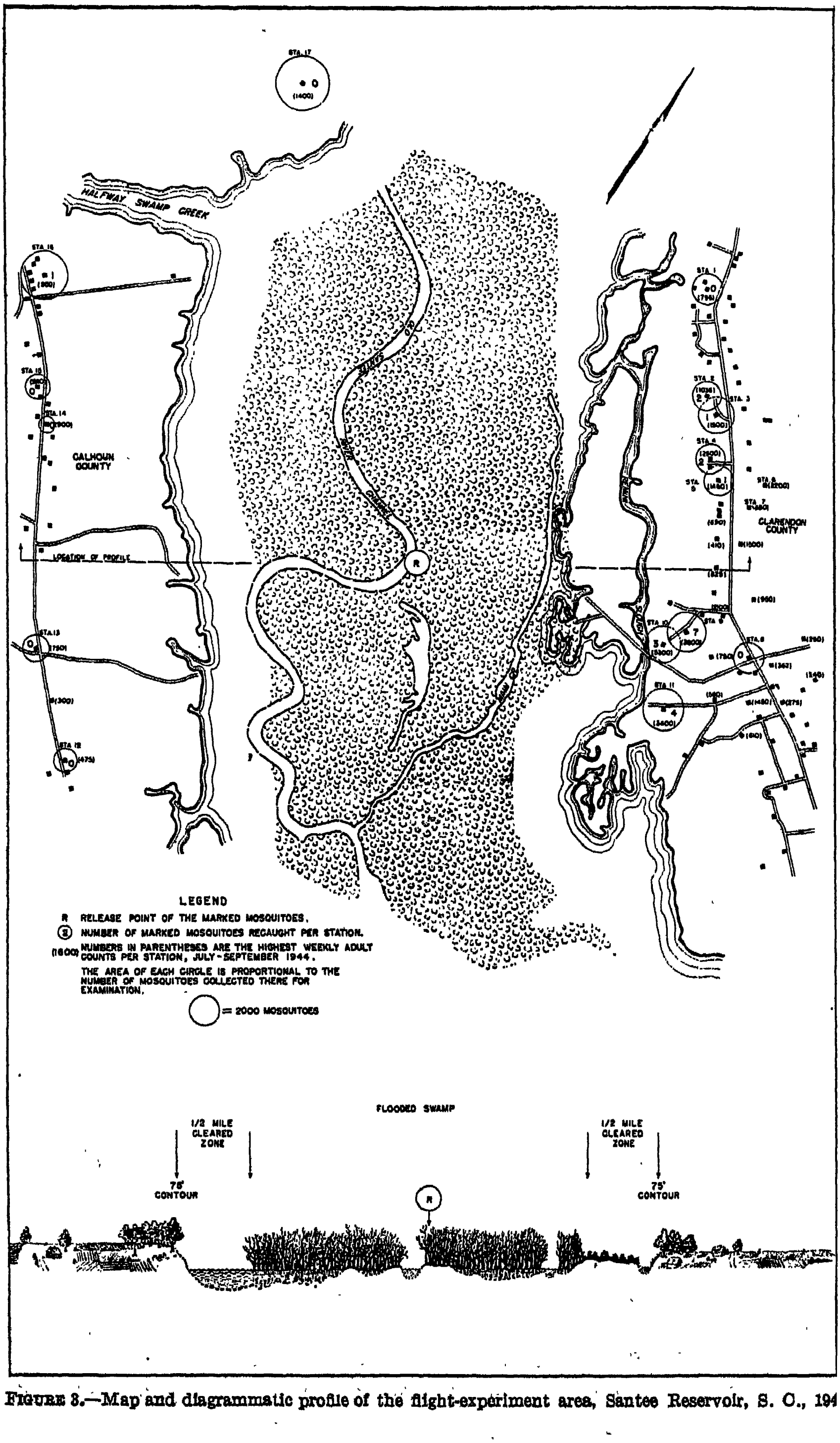

FIGURE 3.—Map and diagrammatic profile of the flight-experiment area, Santee Reservoir, S. C., 194

allowance for dead and crippled individuals it was estimated that about 3,500 were actually liberated. One hundred of the dead mosquitoes were checked for thoroughness of marking, and all were found to be well dusted.

Recovery of marked mosquitoes was attempted on the 4 days subsequent to release and on the sixth and eighth days after release, an average of nearly 7,000 being examined each recatch day. Samples were taken on both sides of the reservoir (fig. 3).

DISCUSSION

Table 2 shows the number of females of *A. quadrimaculatus* examined from each station and the number of recoveries on the days subsequent to release. Also given in the table are the distances of the stations from the release point (R) of the marked mosquitoes. On the map (fig. 3) a circle is drawn around each of the stations, this circle being proportional in area to the number of females examined from the station. Within each circle is given the number of recoveries from that station.

TABLE 2.—*Summary of collections and recoveries (totals of female* A. quadrimaculatus *collected and examined, with the number of marked recoveries in parentheses)*

Station number	House number	Distance from release point (R) (direct line) (miles)	1944								Totals
			Sept. 5	Sept. 6	Sept. 7	Sept. 8	Sept. 9	Sept. 10	Sept. 11	Sept. 12	
1	S-184	3.12	....	....	542*(0)	641(0)	....	....	....	796(0)	1,979 (
2	S-171	2.70	....	....	1,036 (2)	....	....	....	....	776(0)	1,812 (
3	S-161	2.67	249(0)	313(0)	1,169 (1)	1,228(0)	....	....	....	....	2,959 (
4	S-160	2.47	621(0)	333(1)	910 (1)	....	....	....	....	....	1,864 (
5	S-158	2.48	326(0)	310(0)	798	622(1)	....	....	....	....	2,056 (
6	68	....	Used for original catch only				....	....	....	....	....
7	S-167	....	Used for original catch only				....	....	....	....	....
8	S-145	2.75	709(0)	570(0)	424 (0)	351(0)	....	....	....	....	2,054 (
9	S-149	2.20	308(1)	236(0)	1,040 (6)	944(0)	....	....	....	1,134(0)	3,662 (
10	S-150	2.05	660(0)	941(0)	1,463 (3)	....	....	....	....	....	3,064 (
11	S-141	2.25	524(0)	400(0)	1,644 (2)	1,212(2)	....	....	....	499(0)	4,279 (
12	S-38	3.03	....	....	....	431(0)	....	....	....	876(0)	1,307 (
13	S-40	2.94	478(0)	300(0)	....	423(0)	....	....	....	201(0)	1,492 (
14	S-51	3.00	272(0)	234(0)	122 (0)	....	....	....	....	....	628 (
15	S-53	3.25	....	....	....	792(0)	....	675(0)	....	....	1,467 (
16	S-58	3.63	....	822(0)	751 (0)	1,054(0)	....	1,754(1)	....	1,060(0)	5,441 (
17	S-74	3.95	....	....	....	....	....	4,363(0)	....	2,436(0)	6,799 (
			4,147(1)	4,549(1)	9,899(15)	7,698(3)	....	6,792(1)	....	7,778(0)	40,863(2

A total of 40,863 female *A. quadrimaculatus* [2] was caught and examined. In all, 21 (0.6 percent) of the estimated 3,500 marked mosquitoes were recovered, individuals being found in 8 of the 15 stations in which they were sought. All of the 21 were from 2.05 to 3.63 miles, measured in a straight line, from the point of release

[2] So few individuals of *Anopheles crucians* and male *A. quadrimaculatus* were found that these have been omitted in order to simplify the tables.

(R). The percentage recovered compares unusually favorably with the results of other investigators in situations where much shorter flights were involved (table 1).

During the first 2 days after release only 2 marked individuals of nearly 8,700 examined were found, but on the third day 15 of 9,899 examined were marked. Three marked mosquitoes out of 7,698 examined were recovered on the fourth day, and the final recovery was made on the sixth day after release. The last effort at recapture, on the eighth day, was fruitless.

With respect to the distance from the point of release (table 3), the greatest number of recoveries was secured between 2.00 and 2.50 miles. Three individuals were recovered between 2.50 and 3.00 miles and only a single specimen beyond 3.00 miles. In no case was there any intervening habitation and accompanying blood sources in direct line between the release point and the stations from which marked mosquitoes were recovered.

TABLE 3.—*Relation of number of recoveries to distance from the release point (R)*

Distance from release point (miles)	Number examined	Number of marked mosquitoes recovered	Percentage of number examined
2.00—2.49	14,925	17	0.114
2.50—2.99	8,317	3	.036
3.00—3.49	5,381	0	.000
3.50—3.99	12,240	1	.008

It was observed that 20 of the 21 mosquitoes recovered were freshly engorged. Fifteen of these, tested by the Carter Memorial Laboratory, Savannah, Ga., showed that 6 had fed on bovine blood, 5 on equine blood, and 1 on both bovine and equine blood, whereas 3 gave no reaction (possibly either a feeding on wild animals, or on some domestic animal such as a dog, not covered by the precipitin tests in use). The last individual recaught, at the far point of 3.63 miles, was one of those showing no reaction.

It seems possible that the discrepancy in number of recoveries (20 to 1) on the two sides of the reservoir is some evidence of a preponderant dispersion toward the Clarendon side at the time of the experiment. For example it was noted that the day of the greatest number of recoveries (15 on the third day, all on the Clarendon side) coincided with a rise in 7 Clarendon stations from 3,103 mosquitoes on the second day to 7,448 on the third day, despite sterilization of the stations each day. This may indicate a sudden influx of mosquitoes to the Clarendon side which would have increased the chances of recovering marked individuals (no increase in station counts occurred on the Calhoun side).

It might be considered odd that only the single marked individual was recovered from the Calhoun side of the reservoir, and that one with the longest recorded flight. Consideration of this must be weighted by the greater distances involved, for only one of the Calhoun stations was located within 3 miles of the release point (station 13 at 2.94 miles), and about 12,000 of the 17,000 Calhoun females examined were from over 3.6 miles from the point of liberation. Even though there were no intervening habitations, it is still of unusual interest that a recovery was made at so distant a point as 3.63 miles.

This recovery may perhaps be likened to the capture by Clarke (*3*) of a single marked female *A. quadrimaculatus* at a distance of 8 miles, for in each case the flight involved was far in excess of that usually attributed to the species. However, in the case of Clarke's study, which was primarily concerned with culicine mosquitoes, no other specimens of *quadrimaculatus* were captured at shorter distances, and there is nothing to contravert the suspicion that it was an unusually aberrant flight and not representative of the usual dispersal habits of the *quadrimaculatus* population.

In the present experiment, on the other hand, even granting that the lone recovery at 3.63 miles may be an extreme instance, it still seems from the comparatively large number of other recoveries that dispersion in significantly dangerous numbers must be taking place up to 2.7 miles. The conclusion is substantiated by a consideration of the detailed population studies conducted in the same area (table 4, and the Report of the Santee-Cooper Survey (*7*)), including weekly records of adult index stations, availability of breeding places, intensity of breeding, and the distribution of available blood-meal locations (dwellings, stables, etc.).

CONCLUSIONS

Data presented in the preceding pages demonstrate that under the circumstances described *A. quadrimaculatus* females are capable of long flight, as 20 marked individuals of 3,500 released were recaptured 2.0 to 2.7 miles from the point of liberation and a single individual was recovered at 3.63 miles.

Comparisons with previous similar studies are difficult because of several factors affecting the number of recoveries, such as the number of marked mosquitoes released, the number examined in search for marked individuals, size of population into which the marked mosquitoes are diluted, mortality as time elapses, and differences in technique. However, the authors believe that the proportion recovered in this experiment compares unusually favorably with the proportions recovered by other investigators (see table 1) because in this experiment a small number of marked mosquitoes was diluted

TABLE 4.—*Weekly counts of female* Anopheles quadrimaculatus—*Intensive area I*

Zone	Distance from reservoir (miles)	House number	Station type	Week ending — July 29	Aug. 5	Aug. 12	Aug. 19	Aug. 26	Sept. 2	Sept. 9	Sept. 16	Sept. 23	Sept. 30	Oct. 7	Oct. 14	Oct. 21	Oct. 28	Nov. 4	Nov. 11	Nov. 18	Season total	Number of weeks count over 10	Highest single-station count	Average, first 10 weeks
A	0–¼	S-150	Shed	4,200	5,300	5,100	5,100	1,200	1,500	560	715	800	2,450	300	275	239	186	14	14	20	27,973	17	5,300	2,692
		S-141	Stable	850	3,400	1,420	480	565	450	575	875	1,800	1,375	350	800	81	28	8	4	4	13,065	14	3,400	1,179
B	¼–½	S-154	Stable	255	380	410	265	170	53	46	170	243	11	14	7	0	0	1	0	2	2,027	11	410	200
		S-149	Stable	1,450	3,150	3,800	3,650	850	600	360	775	650	525	500	1,200	30	56	9	6	7	17,618	14	3,800	1,581
C	½–¾	S-161	Stable	265	550	750	1,050	550	480	900	1,000	550	388	206	155	14	4	0	2	1	6,865	13	[1] 1,500	648
		S-160	Stable	1,300	2,300	1,475	1,200	900	780	700	780	1,100	238	151	60	54	12	0	0	8	11,058	14	2,300	1,077
		S-158	Shed	1,450	1,225	550	1,225	925	275	650	230	275	280	97	52	4	25	0	0	0	7,263	13	1,450	708
		S-155	Stable	209	650	475	580	365	325	315	120	------	320	157	209	9	34	8	0	10	3,786	12	650	[2] 373
		S-166	Stable	650	585	1,050	1,100	275	375	250	575	625	124	87	12	------	0	3	0	1	5,712	12	[1] 1,500	561
		S-153	Stable	403	720	720	435	350	486	245	825	300	280	81	127	57	22	5	0	0	5,056	14	825	476
		S-148	Stable	475	2,100	1,480	715	1,100	254	165	285	500	230	37	30	0	2	0	0	0	7,373	12	2,100	730
		S-144	Stable	127	475	216	410	115	189	126	170	193	169	155	79	------	4	0	0	0	2,428	12	475	219
		S-142	Stable	180	580	235	410	410	210	180	130	101	120	55	47	4	0	0	0	1	2,663	12	580	256
		S-138	Stable	240	425	610	360	124	129	60	225	259	176	36	111	11	10	1	0	0	2,777	13	610	261
D	¾–1	68	Stable	950	2,200	1,680	1,125	533	135	750	108	302	775	163	105	11	0	0	0	9	8,846	13	2,200	856
		S-167	Stable	102	315	315	675	350	350	300	149	350	94	54	35	0	0	0	0	0	3,089	12	[1] 850	300
		S-164	Stable	127	680	950	455	238	192	425	115	238	365	94	126	5	2	0	0	4	4,016	12	950	378
		S-162	Stable	102	310	525	240	126	127	99	78	82	101	52	58	0	2	0	0	0	1,902	12	525	170
		S-145	Stable	185	390	485	750	186	585	425	215	525	89	115	45	12	0	0	0	0	4,007	13	750	383
		69	Stable	37	126	362	225	64	270	76	38	84	18	31	1	1	0	0	0	0	1,333	11	362	130
		S-143	Stable	530	1,450	840	1,050	415	385	145	140	225	356	181	194	10	19	4	0	2	5,946	13	1,450	554
E	1–2	71	Stable	48	215	116	164	23	43	23	15	28	12	3	6	7	0	0	0	------	703	10	[1] 250	69
		78a	Stable	55	240	103	190	24	3	63	28	23	35	33	33	0	1	0	0	0	831	11	240	76
		78	Stable	180	275	156	215	38	4	23	11	4	3	3	2	0	0	0	0	0	914	7	275	91
F	2–3	F-401	Stable	73	3	53	8	0	5	0	0	1	0	2	2	0	0	0	0	------	147	2	73	14
		F-406	Stable	6	18	60	10	1	6	7	2	12	0	3	0	0	0	0	0	------	125	3	60	12
		F-410	Stable	------	------	19	6	1	3	0	1	4	0	0	7	0	2	0	0	------	43	1	19	[2] 4.2
		F-263	Stable	------	6	23	0	0	0	0	0	0	0	0	14	0	0	0	0	------	43	2	23	[2] 3.2
		F-257	Stable	------	1	2	0	0	0	0	0	0	0	0	2	0	0	0	0	------	5	0	2	[2] .3
		F-312	Stable	------	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	------	0	0	0	[2] 0
		F-314	Stable	------	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	------	6	0	4	[2] .6
		F-323	Stable	------	------	2	0	0	0	0	0	0	0	0	0	0	0	0	0	------	2	0	2	[2] .2
G	3–4	G-157	Stable	------	------	5	4	0	0	2	0	1	0	0	0	0	0	0	0	------	12	0	5	[2] 1.5
		G-139	Stable	------	22	26	10	1	0	1	0	1	0	0	1	0	0	0	0	------	62	2	26	[2] 6.7
		G-146	Stable	------	------	2	1	0	0	0	0	2	0	0	0	0	0	0	0	------	5	0	2	[2] .6
H	4–5	H-120	Stable	------	------	0	7	0	0	1	0	0	0	0	0	0	0	0	0	------	8	0	7	1.0
		H-113	Stable	------	------	1	0	1	0	1	0	0	0	0	0	0	0	0	------	------	3	0	1	[2] .4
		H-107	Stable	------	3	3	3	0	0	1	0	1	0	0	1	0	0	0	0	------	12	0	3	[2] 1.2
		H-109	Stable	------	16	6	5	0	1	0	0	2	1	0	1	0	0	0	0	------	32	1	16	[2] 3.4
		H-159	Stable	------	------	0	0	0	0	0	0	0	0	0	0	0	0	0	0	------	0	0	0	[2] 0
		H- 99	Stable	------	------	0	1	0	0	0	0	0	0	0	0	0	0	0	0	------	1	0	1	[2] .1
		H- 81	Stable	------	------	0	1	0	0	0	0	0	0	0	0	0	0	0	0	------	1	0	1	[2] .1
I	5–6	I-18	Stable	------	------	6	1	0	0	1	0	1	0	0	1	0	0	0	0	------	10	0	6	[2] 1.1
		I-1	Stable	------	------	16	4	0	0	0	0	0	0	0	0	0	0	0	0	------	20	1	16	[2] 2.5

[1] Highest count one or two weeks prior to the week ending July 29, in a few file stations.
[2] Average based on same period, 7/29–9/30, but the division based on only 8 or 9 weeks, in the absence of 1 or 2 early counts.

into what adult station counts indicated was a very large *quadrimaculatus* population. At the Santee Reservoir the central flooded swamp of thousands of acres is a source of large numbers of *quadrimaculatus* mosquitoes, and under these conditions it appears that flight in significant numbers occurs to distances well beyond those considered usual for the species.

Two factors probably contribute principally to this long flight. In the first place production of adults from the central flooded swamp is necessarily prolific because breeding is heavy over vast areas. More important perhaps is the fact that no domestic blood sources were present between the flooded swamp and the stations of recapture. It would thus appear that, within reasonable limits, *A. quadrimaculatus* will fly as far as is necessary to find these domestic sources, a conclusion foreshadowed by the report of Eyles and Bishop (*6*). It should be pointed out that the flights here reported are of course not comparable with the long hibernation flights described for *Anopheles freeborni* and several foreign *Anopheles*.

The above conclusions do not mean that *quadrimaculatus* mosquitoes will necessarily fly in dangerous numbers beyond the commonly applied 1-mile limit of control. However, the data do point to the desirability of individually evaluating each area for which mosquito control is proposed. In many areas, indeed, the evidence indicates that control might result from the elimination of breeding for a radius of as little as one-half mile. On the other hand, in areas such as the locale of the study reported here, it is evident that the mile limit should not be rigidly adhered to when significant modifying factors are present.

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DDT RESIDUAL HOUSE SPRAY—A METHOD OF MALARIA CONTROL IN RURAL AREAS [1]

By FREDERICK L. KNOWLES, *Senior Biophysicist*, and CLINTON S. SMITH, *Laboratory Technician, United States Public Health Service*

Malaria control in rural areas is an unsolved problem in the Southern States. Methods of control, such as larviciding and drainage, are usually not applicable because of the high per capita cost. In addition, the problem is more involved because of the low standards of living and poor housing of the rural population.

Russell and Knipe (*1*) and others have shown that periodic insecticidal spraying of places of human habitation is a comparatively inexpensive and effective means of controlling malaria in southern India. The unique residual toxicity (*2*) of DDT (2,2 bis-parachlorophenyl-1,1,1 trichloroethane) when used as a spray should render this method of controlling malaria still less expensive by reducing the number of sprayings necessary for effective control and, consequently, might be expected to become a practical method of controlling malaria in rural areas.

Because cost and man-hours as well as effectiveness are the criteria of a successful method of rural malaria control, a study of these factors was made during the summer of 1944 while carrying out a pilot house-spraying program using DDT residual spray.

The area selected, approximately 36 square miles in extent, was located in Lake Township, Phillips County, Ark., near the town of Helena. This is a part of the Delta country, and the chief occupation of the people is growing cotton. The area for the most part is divided into plantations, and 95 percent of the houses are the tenant or share-cropper type of "shotgun" construction, in such condition that adequate screening without additional repairs is impossible. The interiors are roughly finished and mostly lined with wrapping paper or newspapers. The houses are widely scattered and located on ungraded dirt roads and in fields.

The population consists of plantation Negroes, with little education and low nutritional standards, who maintain a marginal living. A total of 545 houses was counted in this area. Of these, 27 were adequately screened, 286 inadequately screened, and 232 had no screening. Interviews indicated past histories of malaria in 66 persons from 41 families. No difficulties were experienced in obtaining permission from plantation owners and foremen in advance of spraying operations.

MATERIALS AND METHODS

The spraying equipment consisted of a 50-gallon Hardie orchard sprayer powered with a 1-horsepower gasoline engine and mounted

[1] From the Office of Malaria Investigations, National Institute of Health.

on a ¾-ton Army weapons carrier. The sprayer was fitted with 100 feet of hose, to which was attached a shut-off valve from a Hudson Knapsack Sprayer and a 40-inch length of ¼-inch pipe. A special nozzle was used which delivered a flat, fan-type, 85° spray with a rated delivery of 0.16 gallon per minute at 100 pounds' pressure.

The spray material consisted of a stock solution to which was added sufficient water to produce a final spray of desired DDT concentration. The stock solution was prepared according to the following formula:

	Percent
DDT	23
Xylol	71
Triton X-100	6

Sprays containing 5, 2½, and 1 percent DDT in the final mixture were used.

Two operators were employed to carry on the spraying operations—one man to drive the truck and operate the sprayer motor, the other to carry the hose into the house and do the actual spraying. Both of these operators had had no previous experience, were of high school age, and were employed for the summer only.

Ordinary operations consisted of parking the truck near the front entrance of the house, unwinding the hose, and carrying it to the farthest room in the house. Actual spraying consisted of quickly moving the fan-type spray up and down the walls and across the ceiling. While no particular effort was made to obtain an even or complete coverage of the walls and ceilings, nearly complete coverage was obtained. The extent of coverage could be plainly seen while spraying was being done. In some houses, in order to render walls accessible to the spray, furniture and clothes were removed from the walls.

The operator, while spraying, always wore a respirator, and articles of food in the houses were covered to avoid accidental contamination.

Along with the two operators went one man who timed the operations, checked the concentration and the amount of spray used, obtained necessary data concerning the houses (approximate area sprayed, number of rooms, number of inhabitants), and designated each house by a number on both his data sheet and the house itself. The same observer was later employed to make daily inspections of the houses for resting adult mosquitoes.

Because of the deleterious effect of the solvent (xylol) on rubber gaskets and hose, much time was lost, due to the blocking of strainers and nozzles. A shortage of labor on the plantations compelled every able-bodied worker to be in the fields every day. For this reason, the occupants of houses to be sprayed were in fields and not at home, and time was lost because adjacent houses could not be sprayed in consecutive order, making return trips necessary.

Twenty houses in the study area were left untreated in order to determine the mosquito population in unsprayed houses, for comparison with that in the sprayed houses. Houses to be left untreated were selected by skipping every twenty-fifth house during spraying operations.

To determine the residual effectiveness of the spray and to obtain a measure of the efficiency of the spraying operations, mosquito populations in sprayed houses were to be observed and compared with the same data obtained in a number of unsprayed houses. Sprayed houses chosen for inspection were in the immediate vicinity of the unsprayed houses, and choice was determined by similarity of size, outbuildings, and number of inhabitants and livestock.

Spraying operations were begun on July 4 and were completed on August 14.

Daily inspections of the walls and ceilings were begun on August 15 for resting female *A. quadrimaculatus* adults (in the unsprayed houses and in the chosen sprayed houses). Previous personal observations have shown that once the mosquitoes have made sufficient contact with DDT to become affected they immediately attempt to leave through any available opening. For this reason we expected to find fewer mosquitoes in the sprayed houses than in the unsprayed houses.

Also, mosquitoes already in the house in the early morning would seek a daytime resting place in the house, and possibly mosquitoes outside would come in for the same reason. If the DDT residual spray was effective, the mosquitoes resting on the ceiling and walls in the early morning should be dead later in the day. For this reason, inspections of the sprayed houses were made early in the morning—during the first and second hours immediately following daybreak. These houses were inspected again later in the day; at which time an equal number of unsprayed houses were inspected.

A careful inspection of all walls and ceilings was made with a flashlight. The same inspector did all of the inspections; checking by one of the authors was done weekly. Personal bias, if present, is in the data for both the sprayed and unsprayed houses.

To determine further the toxicity of the sprayed walls and ceilings, open-topped cages were attached to the ceiling, 100 *Aedes aegypti* mosquitoes released into the cage, and mortality noted after 24 hours. Cages were placed on ceilings with 5 percent, 2½ percent, and 1 percent spray and on unsprayed ceilings. Difficulties in keeping the *A. aegypti* alive were experienced while transporting them from Memphis, and in keeping them alive in the cage for the period of testing; cages on unsprayed ceilings showed a large mortality. For this reason, mortality comparisons of cages on sprayed and unsprayed ceilings did not reflect the true toxicity of the ceilings and are not given.

RESULTS AND DISCUSSION

A summary of the data obtained during spraying operations relative to time and material required for spraying rural houses with a DDT residual spray is given below:

Total number of houses sprayed		513
Total amount of spray used	gallons	417
Total number of operators		2
Total spraying time (86.4 hours)	minutes	5, 185
Total traveling time (99.8 hours)	do	5, 987
Total area sprayed	square feet	1, 236, 690
Total population of houses sprayed		2, 090
Average number of houses sprayed per 8-hour day		20
Average sprayed area per house	square feet	2, 410
Average number of rooms per house		3. 6
Average amount of spray used per house	gallons	. 82
Average spraying time per house	minutes	10. 1
Average traveling time per house	do	11. 7
Total time per house	do	21. 8
Total man-hours per house		. 73

The times given in the above summary do not include traveling between headquarters and the field of operations, because such a factor would vary among communities and could be easily obtained with any particular situation.

Time, which is not included in the summary, was devoted to mixing sprays of various concentrations and preparation of the stock solution. Ordinarily, in routine operation but one concentration of spray would be used, and the ready-mixed stock solution furnished the operators.

Several types of nozzles, shut-off valves, and spray rods were tried, and the time devoted to this is not included in the summary.

On days that routine spraying only was done approximately 20 houses were sprayed per day.

The amount of spray used per 1,000 square feet was 0.337 gallon, and the calculated deposit of DDT in milligrams per square foot was 64, when using a 5-percent DDT spray.

Approximate costs per house are as follows:

	Cents
0.82 gallon of 5-percent DDT at 47 cents per gallon	39
0.73 man-hours at 48 cents per hour	35
Total material and labor costs per house	74

This cost of 74 cents per house does not include any overhead, or expenses relative to the truck and sprayer equipment. Estimates of allowances for truck and sprayer equipment, which include depreciation and operation, are about 25 cents a house, so that the direct cost per house should be less than $1.

There were on the average 4 people to a house, so that at $1 per house the per capita cost was about 25 cents. The total cost for 513 houses at $1 a house scattered over 36 square miles was $513, or a cost of $14.25 per square mile in an area averaging 14 houses per square mile.

While a ¾-ton weapons carrier was used, a ½-ton pick-up truck has been employed satisfactorily with this equipment on other work and could be used in routine spraying.

With improvements in equipment, and the routine of spraying and cheaper spray material, a reduction could be made in the cost figure given.

The daily inspections have been divided into two periods, the first from August 14, when spraying was completed, to September 15; the second from September 15 to October 15, to indicate the decrease in toxicity, if any, of the residual spray with time. Inspections of unsprayed houses were made at the time of the second inspection of sprayed houses, so that the second inspections of sprayed houses are comparable in time with inspections of unsprayed houses.

Weekly inspections were continued after October 15, but the mosquito population was reduced to such an extent that data sufficient for comparisons were not obtainable. With the advent of cooler weather, there seemed to be a marked increase in the number of dead flies. A summary of the information obtained from these inspections is shown in table 1.

TABLE 1.—*Average number of resting female* A. quadrimaculatus *adults per house for two consecutive monthly inspection periods, in houses sprayed with sprays of various DDT concentrations and in unsprayed houses*

Inspection period (1944)	Unsprayed		5-percent DDT spray				2½-percent DDT spray				1-percent DDT spray			
	Number of houses	Inspection (p. m.)	Number of houses	Inspection		Percent reduction No. 2-No. 1	Number of houses	Inspection		Percent reduction No. 2-No. 1	Number of houses	Inspection		Percent reduction No. 2-No. 1
				No. 1 (a. m.)	No. 2 (p. m.)			No. 1 (a. m.)	No. 2 (p. m.)			No. 1 (a. m.)	No. 2 (p. m.)	
Aug. 15 to Sept. 14	78	6.2	62	1.34	0.17	87	11	1.7	0.92	46	13	4.0	2.32	42
Sept. 15 to Oct. 14	88	3.6	61	1.86	.43	77	12	2.6	.93	64	15	2.5	1.2	52

The immediate insecticidal effect of the spray was very pronounced because of the prevalence of large numbers of flies. In some houses, after spraying was completed the floors were literally covered with flies. Moribund mosquitoes were also found.

A larger mosquito population would have given more reliable data. The data given for the houses sprayed with 5-percent DDT are the

most reliable, because they are based on a larger number of sprayed and inspected houses.

The percentage reductions of resting adults for the three concentrations of DDT as given in table 2 were calculated from the data in table 1. A decrease in toxicity with time occurred for both the 5- and

TABLE 2.—*Percent reduction in resting female* A. quadrimaculatus *adults in houses sprayed with 5-percent, 2½-percent, and 1-percent DDT as compared with unsprayed houses for two consecutive monthly inspection periods—computed from data in table 1*

Period	5-percent DDT spray	2½-percent DDT spray	1-percent DDT spray
Aug. 15 to Sept. 15	97	85	63
Sept. 15 to Oct. 14	88	74	66
Aug. 15 to Oct. 14	94	81	66

2½-percent DDT sprays, while the toxicity of the 1-percent DDT spray remained about the same, although this fact is not significant.

SUMMARY

Material, methods, and equipment employed for the spraying of 513 rural houses are described. Analysis of the data indicates that for each house sprayed an average of 0.82 gallons of spray was used and 0.73 man-hours employed for a combined cost of 74 cents per house.

The number of resting mosquitoes in unsprayed houses as compared with the sprayed houses was reduced 94, 81, and 66 percent for the 5-, 2½-, and 1-percent DDT concentration sprays, respectively, for the 2-month period following spraying.

ACKNOWLEDGMENTS

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PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 6, 1945

Summary

The seasonal downward trend in the incidence of poliomyelitis, begun with the week ended September 22, following the highest weekly reported incidence of the year (week ended September 15, 962 cases), continued for the third consecutive week. For the current week a total of 595 cases was reported, as compared with 774 last week, 877 for the corresponding week last year, and a 5-year median (1940–44) of 515. Decreases occurred in all areas except the East South Central and Mountain, where slight increases were reported. Seventeen States reported 10 or more cases each, 6 of which reported slight increases. They are as follows (last week's figures in parentheses): Massachusetts 44 (39), Iowa 24 (23); Nebraska 10 (6), Virginia 14 (11), Tennessee 18 (12), Montana 13 (10).

The Middle Atlantic and East North Central areas have reported the largest numbers of cases to date this year (approximately 46 percent), and these same areas reported the largest numbers for the same period in 1944 (approximately 61 percent). New York State reported the largest number of cases for this period in both years (1,568 in 1945 and 5,097 in 1944), with Texas second in 1945 (883 cases) and Pennsylvania second in 1944 (1,206 cases).

Of the total of 89 cases of meningococcus meningitis, as compared with 101 last week, 142 for the same week last year, and 62 for the 5-year median, 13 occurred in Illinois, 10 in California, 8 each in New York and Texas, and 4 each in Indiana and West Virginia. The total to date is 6,768, as compared with 13,998 and 14,714 for the corresponding periods of 1944 and 1943, respectively, and a 5-year median of 2,733.

Of a total of 28 cases of infectious encephalitis reported for the week, 19 occurred in California, where 238 cases have been reported this year, as compared with 53 for the same period last year.

For the current week, 8,313 deaths have been recorded in 93 large cities of the United States, as compared with 8,378 last week, 8,290 for the corresponding week last year, and a 3-year (1942–44) average of 8,508. The total for the year to date is 358,239, as compared with 359,809 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended October 6, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended— Oct. 6, 1945	Diphtheria: Week ended— Oct. 7, 1944	Diphtheria: Median 1940–44	Influenza: Week ended— Oct. 6, 1945	Influenza: Week ended— Oct. 7, 1944	Influenza: Median 1940–44	Measles: Week ended— Oct. 6, 1945	Measles: Week ended— Oct 7, 1944	Measles: Median 1940–44	Meningitis, meningococcus: Week ended— Oct. 6, 1945	Meningitis, meningococcus: Week ended— Oct. 7, 1944	Meningitis, meningococcus: Median 1940–44
NEW ENGLAND												
Maine	1	0	0	----	----	----	4	1	28	0	0	0
New Hampshire	0	0	0	----	----	----	0	6	4	0	0	0
Vermont	1	0	0	----	----	----	1	0	0	1	0	0
Massachusetts	8	4	3	----	----	----	82	47	53	1	3	3
Rhode Island	0	0	0	8	6	----	0	0	1	0	0	1
Connecticut	0	0	0	----	1	1	5	8	5	0	2	2
MIDDLE ATLANTIC												
New York	3	11	9	[1] 5	[1] 1	[1] 5	20	11	76	8	12	12
New Jersey	0	1	2	3	6	4	14	4	29	3	5	0
Pennsylvania	12	4	6	1	2	----	81	21	60	3	5	4
E. NORTH CENTRAL												
Ohio	21	11	18	3	8	4	9	13	18	3	15	2
Indiana	9	5	8	15	1	11	6	1	4	4	5	1
Illinois	6	13	10	1	0	6	49	11	19	13	8	5
Michigan [2]	9	11	8	----	----	2	60	20	30	2	9	2
Wisconsin	0	0	0	23	6	14	17	58	58	2	2	2
W. NORTH CENTRAL												
Minnesota	5	7	2	----	----	----	3	4	4	1	2	1
Iowa	2	2	4	----	----	1	2	1	6	2	1	0
Missouri	5	3	3	2	2	1	5	1	1	3	5	0
North Dakota	1	2	2	8	----	5	0	0	6	0	0	0
South Dakota	0	2	3	----	----	----	2	1	3	0	0	0
Nebraska	0	0	1	----	4	----	3	3	8	0	2	0
Kansas	6	3	3	1	----	2	5	7	4	1	2	1
SOUTH ATLANTIC												
Delaware	1	0	0	----	----	----	0	0	0	0	0	0
Maryland [2]	19	15	7	----	----	1	1	0	5	0	7	3
District of Columbia	0	0	0	----	2	----	1	1	1	0	0	0
Virginia	19	10	16	153	57	83	3	12	10	3	2	2
West Virginia	14	8	10	----	----	6	0	4	4	4	1	1
North Carolina	68	25	48	----	6	2	6	2	13	2	1	1
South Carolina	24	16	25	177	154	154	3	2	7	3	6	0
Georgia	30	21	31	4	87	15	3	2	2	1	1	1
Florida	7	10	10	1	----	1	0	2	2	1	0	0
E. SOUTH CENTRAL												
Kentucky	8	4	14	1	1	1	9	2	3	2	1	1
Tennessee	32	5	10	----	5	5	3	6	6	3	1	0
Alabama	30	53	29	21	25	15	1	2	4	1	3	1
Mississippi [2]	26	20	20	----	----	----	----	----	----	1	0	1
W. SOUTH CENTRAL												
Arkansas	12	7	17	6	28	22	3	6	3	1	3	0
Louisiana	10	11	9	4	1	3	1	1	1	1	1	1
Oklahoma	8	21	14	13	22	22	10	1	3	0	0	0
Texas	59	52	52	499	580	458	22	25	15	8	7	2
MOUNTAIN												
Montana	4	2	2	13	7	2	45	2	6	0	0	0
Idaho	2	0	0	9	9	3	73	2	2	0	1	0
Wyoming	1	4	0	----	----	2	0	1	2	0	1	0
Colorado	11	8	5	12	5	15	4	7	8	0	1	0
New Mexico	3	5	1	----	----	----	1	0	2	0	0	0
Arizona	1	1	1	23	36	39	0	0	6	0	2	0
Utah [2]	0	0	0	----	----	----	4	4	5	0	1	0
Nevada	0	0	0	1	1	----	0	0	0	0	1	0
PACIFIC												
Washington	4	10	5	----	----	----	40	17	17	1	6	1
Oregon	3	3	3	1	4	6	10	38	21	0	1	1
California	29	19	13	13	7	17	126	114	56	10	16	6
Total	514	409	432	1,021	1,080	1,080	737	471	824	89	142	62
40 weeks	11,263	8,838	9,924	77,205	343,550	172,612	105,474	594,370	544,415	6,768	13,998	2,733

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended October 6, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Oct. 6, 1945	Oct. 7, 1944		Oct. 6, 1945	Oct. 7, 1944		Oct. 6, 1945	Oct. 7, 1944		Oct. 6, 1945	Oct. 7, 1944	
NEW ENGLAND												
Maine	3	2	1	26	13	4	0	0	0	0	1	0
New Hampshire	0	4	1	0	2	3	0	0	0	0	0	0
Vermont	3	2	2	3	6	4	0	0	0	0	0	0
Massachusetts	44	20	10	52	72	81	0	0	0	2	2	3
Rhode Island	0	0	0	3	2	2	0	0	0	0	0	0
Connecticut	6	13	10	11	8	10	0	0	0	4	0	1
MIDDLE ATLANTIC												
New York	80	294	52	105	88	101	0	0	0	7	8	10
New Jersey	34	33	13	23	25	38	0	0	0	4	3	3
Pennsylvania	41	54	11	78	89	89	0	0	0	7	14	15
EAST NORTH CENTRAL												
Ohio	27	73	32	141	142	122	0	0	0	6	4	6
Indiana	9	12	10	39	27	39	0	1	1	1	4	3
Illinois	60	33	33	66	97	97	0	0	0	1	1	7
Michigan[2]	8	23	19	65	65	67	0	0	0	2	4	4
Wisconsin	44	26	14	41	58	66	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	17	40	22	13	38	38	0	0	0	0	0	0
Iowa	24	15	15	37	39	34	0	0	0	1	0	1
Missouri	12	10	9	11	15	24	0	0	0	2	1	7
North Dakota	0	2	2	6	0	5	0	0	0	0	0	1
South Dakota	3	1	1	5	5	9	0	0	0	0	1	1
Nebraska	10	6	6	7	19	10	1	0	0	0	0	0
Kansas	4	5	5	37	45	45	1	0	0	0	1	1
SOUTH ATLANTIC												
Delaware	1	7	1	3	1	3	0	0	0	1	0	0
Maryland[2]	9	22	2	45	30	18	0	0	0	1	3	4
District of Columbia	6	5	2	10	5	13	0	0	0	1	0	1
Virginia	14	30	10	70	44	24	0	0	0	4	2	6
West Virginia	3	13	2	37	81	62	0	0	0	3	1	6
North Carolina	6	12	7	59	54	77	0	0	0	2	4	4
South Carolina	5	3	3	11	8	15	0	0	0	2	5	7
Georgia	8	3	2	22	21	31	0	0	0	2	16	7
Florida	5	1	1	2	3	4	0	0	0	0	3	1
EAST SOUTH CENTRAL												
Kentucky	4	27	6	32	29	32	0	0	0	9	5	10
Tennessee	18	7	3	37	38	54	0	0	0	11	9	9
Alabama	3	3	0	13	33	30	0	0	0	0	4	4
Mississippi[2]	4	3	2	13	19	14	1	0	0	8	6	6
WEST SOUTH CENTRAL												
Arkansas	2	3	3	11	12	11	0	0	0	7	0	3
Louisiana	6	1	1	6	2	3	0	0	0	3	6	6
Oklahoma	1	1	3	17	13	14	0	0	0	4	2	4
Texas	20	8	7	66	36	31	0	0	0	10	11	11
MOUNTAIN												
Montana	13	0	1	11	10	10	0	0	0	1	0	0
Idaho	0	2	0	11	16	10	0	0	0	0	2	1
Wyoming	1	0	0	0	1	2	0	0	0	0	0	0
Colorado	6	4	3	19	22	15	0	0	0	2	0	1
New Mexico	1	0	1	5	5	5	0	0	0	5	5	5
Arizona	2	2	1	9	5	5	0	0	0	0	4	2
Utah[2]	15	0	2	6	10	10	0	0	0	0	0	1
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	7	18	18	11	29	29	0	0	0	1	0	0
Oregon	7	11	8	13	30	14	0	0	0	4	3	0
California	43	23	10	165	124	95	0	0	0	4	3	5
Total	639	877	515	1,473	1,536	1,536	3	1	4	122	139	163
40 weeks	10,296	15,423	6,918	142,235	154,498	106,353	286	321	644	3,943	4,474	5,513

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately as follows: Massachusetts 1; New York 1; Ohio 2; Virginia 2; Georgia 1; Oklahoma 1; Montana 1; California 2.

Telegraphic morbidity reports from State health officers for the week ended October 6, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended October 6, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
	Oct. 6, 1945	Oct. 7, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	13	5	13	0	0	0	0	0	0	0	1
New Hampshire	15	0	0	0	0	0	0	0	0	0	0
Vermont	9	51	20	0	0	0	0	0	0	0	1
Massachusetts	124	76	117	2	1	0	0	0	0	0	1
Rhode Island	9	22	22	0	0	0	0	0	0	0	0
Connecticut	20	29	47	0	4	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	217	150	262	2	136	0	2	1	0	1	7
New Jersey	140	54	100	0	0	9	2	0	0	1	1
Pennsylvania	137	91	199	0	0	0	0	1	0	0	6
EAST NORTH CENTRAL											
Ohio	149	132	160	3	1	3	0	1	1	0	1
Indiana	16	6	15	1	0	8	0	0	0	0	1
Illinois	68	40	136	2	0	0	2	0	0	0	12
Michigan [2]	135	38	210	1	6	1	0	0	0	0	2
Wisconsin	38	81	151	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota	10	18	25	0	0	0	0	0	0	0	6
Iowa	1	33	17	0	0	0	0	0	0	0	3
Missouri	12	12	12	0	0	0	2	0	2	0	0
North Dakota	1	13	12	0	0	0	0	0	0	0	0
South Dakota	2	9	2	0	0	0	0	0	0	0	2
Nebraska	0	8	6	0	0	0	0	0	0	0	0
Kansas	11	21	27	0	0	0	1	0	0	0	4
SOUTH ATLANTIC											
Delaware	0	0	0	0	0	0	0	0	0	0	0
Maryland [2]	36	68	68	0	0	6	0	0	0	0	0
District of Columbia	15	1	7	0	0	0	0	0	0	0	0
Virginia	26	18	24	1	0	200	0	0	1	0	2
West Virginia	14	15	15	0	0	0	0	0	0	0	0
North Carolina	54	84	79	1	3	0	0	1	0	8	1
South Carolina	70	57	31	0	30	0	0	0	3	2	0
Georgia	31	4	5	1	2	0	0	0	0	23	5
Florida	5	11	11	0	0	0	0	0	0	5	0
EAST SOUTH CENTRAL											
Kentucky	22	12	54	0	0	0	0	0	0	0	0
Tennessee	27	10	26	0	0	0	0	0	0	4	1
Alabama	14	12	18	0	0	0	0	1	0	19	5
Mississippi [2]				0	0	0	0	0	1	15	2
WEST SOUTH CENTRAL											
Arkansas	1	37	19	0	16	0	0	0	3	0	2
Louisiana	2	0	0	1	10	0	0	0	0	11	2
Oklahoma	1	5	5	0	0	0	0	0	0	0	1
Texas	75	159	94	10	253	29	0	0	1	25	7
MOUNTAIN											
Montana	20	35	15	0	0	0	0	0	0	0	0
Idaho	4	0	0	0	0	0	0	0	0	0	2
Wyoming	0	5	5	0	0	0	0	0	0	0	1
Colorado	21	10	30	0	1	0	0	0	0	0	0
New Mexico	2	1	3	0	3	0	0	1	0	0	0
Arizona	14	9	9	0	0	7	0	0	0	0	0
Utah [2]	12	7	11	0	0	0	0	0	2	0	2
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	17	11	23	0	0	0	0	0	0	0	1
Oregon	27	8	10	0	0	0	0	0	0	0	0
California	170	78	154	6	8	0	19	0	0	0	4
Total	1,807	1,546	2,350	31	474	263	28	6	14	114	95
Same week, 1944	1,546			67	558	165	16	4	6	165	64
Average, 1942–44	2,067			51	333	131	14	[4] 4	7	[4] 105	
40 weeks, 1945	99,343			1,463	20,545	9,027	511	443	603	3,788	3,702
1944	75,109			1,368	17,692	7,044	525	437	450	3,907	3,149
Average, 1942–44	122,270		[4] 141,736	1,321	13,551	6,336	511	[4] 437	615	[4] 2,675	

[2] Period ended earlier than Saturday.

[4] 5-year median, 1940–44.

Leprosy: California 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended September 29, 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	0	0	1	4	1	0	0	5
New Hampshire:												
Concord	0	0	------	0	0	0	2	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	2	0	------	0	3	1	3	17	11	0	0	40
Fall River	0	0	------	0	0	0	0	0	2	0	0	0
Springfield	2	0	1	1	0	0	1	0	3	0	0	1
Worcester	0	0	------	0	7	0	9	1	3	0	0	9
Rhode Island:												
Providence	0	0	------	0	0	0	0	0	0	0	1	16
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	0	0	0	0
Hartford	0	0	------	0	0	1	4	1	2	0	0	4
New Haven	0	0	------	0	0	0	1	0	1	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	8	4	7	0	1	11
New York	6	5	------	1	5	6	34	33	26	0	9	120
Rochester	0	0	------	0	0	0	1	2	4	0	0	3
Syracuse	0	0	------	0	2	0	3	0	5	0	0	25
New Jersey:												
Camden	0	0	------	0	0	0	0	1	2	0	0	0
Newark	0	0	------	0	3	0	1	0	2	0	0	23
Trenton	0	0	1	0	0	0	0	0	0	0	0	2
Pennsylvania:												
Philadelphia	3	0	------	1	9	1	14	20	14	0	3	90
Pittsburgh	0	0	1	2	4	0	6	0	10	0	0	12
Reading	0	0	------	0	0	0	1	0	2	0	0	0
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	0	1	7	4	6	0	1	6
Cleveland	0	0	1	0	0	2	0	4	11	0	0	35
Columbus	6	0	------	0	0	1	2	2	6	0	0	6
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	0	0	0	0
Indianapolis	6	0	------	0	0	2	3	0	4	0	0	5
South Bend	0	0	------	0	1	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	3	0	0	0
Illinois:												
Chicago	1	0	------	0	26	3	14	25	13	0	1	50
Springfield	0	0	------	0	0	0	1	0	0	0	0	3
Michigan:												
Detroit	4	0	------	0	6	1	5	3	20	0	0	67
Flint	0	0	1	0	9	0	1	1	2	0	0	3
Grand Rapids	0	0	------	0	1	0	0	0	1	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	0	0	0	2
Milwaukee	0	0	------	0	1	1	1	15	6	0	0	11
Racine	0	0	------	0	0	0	0	0	0	0	0	6
Superior	0	0	------	0	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	0	0	3	0	0	1
Minneapolis	1	0	------	0	3	0	4	14	6	0	0	3
St. Paul	0	1	------	0	1	0	1	0	4	0	0	7
Missouri:												
Kansas City	0	0	------	0	0	2	4	0	10	0	0	4
St. Joseph	0	0	------	0	0	1	0	0	1	0	0	0
St. Louis	0	1	------	0	0	5	5	13	3	0	0	6

See footnotes at end of table.

City reports for week ended September 29, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota												
Fargo	0	0	------	0	0	0	0	0	2	0	0	0
Nebraska:												
Omaha	0	0	------	0	0	0	1	0	0	0	0	0
Kansas:												
Topeka	0	0	------	0	1	0	0	0	1	0	0	0
Wichita	0	0	1	1	1	0	1	0	3	0	0	0
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	1	1	0	0	0	4
Maryland:												
Baltimore	8	0	------	0	0	0	12	2	7	0	0	37
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	0	3	8	9	0	0	13
Virginia:												
Lynchburg	0	0	------	0	0	0	1	0	6	0	0	0
Richmond	0	0	------	0	1	0	1	14	4	0	0	2
Roanoke	0	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	0	2	0	1	0	0	0
North Carolina:												
Raleigh	1	0	------	0	0	0	0	0	0	0	0	2
Wilmington	2	0	------	0	0	0	1	0	1	0	0	4
Winston-Salem	0	0	------	0	0	0	1	0	7	0	0	5
South Carolina:												
Charleston	0	0	2	0	0	0	3	0	2	0	0	0
Georgia:												
Atlanta	1	0	1	0	0	0	1	0	3	0	0	2
Brunswick	0	0	------	0	0	0	3	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	0	0	0	0
Florida:												
Tampa	1	0	------	0	0	1	7	1	1	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	3	0	0	1	8	2	2	0	0	2
Nashville	0	0	------	0	0	0	1	0	1	0	0	0
Alabama:												
Birmingham	0	0	------	0	0	0	2	4	0	0	2	1
Mobile	0	0	------	0	0	0	1	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	1	0	2	0	2	0	0	0
Louisiana:												
New Orleans	3	0	1	0	2	4	4	1	10	0	0	4
Shreveport	1	0	------	0	0	0	6	2	0	0	1	0
Texas:												
Dallas	1	0	------	0	1	0	1	2	5	0	0	2
Galveston	0	0	------	0	0	0	2	0	0	0	0	0
Houston	2	0	------	0	0	1	4	2	6	0	0	0
San Antonio	0	0	------	0	1	0	3	1	0	0	1	2
MOUNTAIN												
Montana:												
Billings	0	0	------	0	3	0	0	3	0	0	0	0
Great Falls	0	0	------	0	1	0	0	0	1	0	0	1
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	1	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	1	0	0	0	5	2	2	0	0	18
Pueblo	0	0	------	0	0	0	1	0	0	0	0	6
Utah:												
Salt Lake City	0	0	------	0	0	0	1	6	4	0	0	1

City reports for week ended September 29, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0		0	30	0	2	4	6	0	0	2
Spokane	1	0	2	0	0	0	2	0	1	0	0	0
Tacoma	0	0		0	11	0	0	1	2	0	0	0
California:												
Los Angeles	3	0		1	8	1	1	9	25	0	0	22
Sacramento	0	2		0	2	0	1	1	0	0	0	3
San Francisco	0	0		0	35	0	3	2	10	0	0	17
Total	57	9	15	8	181	36	226	232	320	0	20	734
Corresponding week, 1944	63		38	8	100		255		330	0	29	506
Average, 1940–44	63		42	[1] 13	[2] 167		[1] 259		357	0	32	919

[1] 3-year average 1942–44.
[2] 5-year median 1940–44.

Anthrax.—Cases: Boston 1.
Dysentery, amebic.—Cases: New York 6; Philadelphia 1; Chicago 2.
Dysentery, bacillary.—Cases: New Haven 3; New York 20; Syracuse 1; Detroit 5; Charleston, S. C. 14; Atlanta 1; Los Angeles 2.
Dysentery, unspecified.—Cases: Baltimore 2; Richmond 3; San Antonio 12.
Leprosy.—Cases: Chicago 1.
Tularemia.—Cases: St. Louis 1.
Typhus fever, endemic.—Cases: Philadelphia 1; Wilmington, N. C. 1; Charleston, S. C. 1; Atlanta 8; Savannah 4: Birmingham 4; Mobile 1; New Orleans 12: Shreveport 3; Dallas 1; Houston 1; San Antonio 3; Los Angeles 2.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,318,100)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	10.5	0.0	2.6	2.6	26	5.2	54.9	60.1	63	0.0	2.6	199
Middle Atlantic	4.2	2.3	0.9	1.9	11	3.2	31.5	27.8	33	0.0	6.0	132
East North Central	10.3	0.0	0.6	0.6	27	6.7	21.3	32.8	44	0.0	1.2	122
West North Central	2.0	4.0	2.0	2.0	12	15.9	31.8	53.7	66	0.0	0.0	42
South Atlantic	21.8	0.0	5.0	0.0	2	1.7	60.3	43.5	69	0.0	0.0	116
East South Central	0.0	0.0	17.7	0.0	0	5.9	70.8	35.4	24	0.0	11.8	18
West South Central	20.1	0.0	2.9	0.0	14	14.3	63.1	23.0	66	0.0	5.7	23
Mountain	7.9	0.0	7.9	0.0	40	0.0	55.6	87.4	56	0.0	0.0	207
Pacific	7.9	3.2	3.2	1.6	136	1.6	14.2	26.9	70	0.0	0.0	70
Total	8.7	1.4	2.3	1.2	28	5.5	34.4	35.3	49	0.0	3.0	112

PLAGUE INFECTION IN MERCED COUNTY, CALIF.

Under date of October 1, plague infection was reported proved, on September 28, in a pool of 200 fleas from 54 ground squirrels, *C. beecheyi*, shot 12 miles west and 1 mile north of Los Banos, Merced County, Calif.

TERRITORIES AND POSSESSIONS

Hawaii Territory

Plague (rodent).—A rat found on September 6, 1945, in District 1A, Kukuihaele area, Honokaa, Hamakua District, Island of Hawaii, T. H., was proved positive for plague on September 12, 1945.

Panama Canal Zone

Notifiable diseases—August 1945.—During the month of August 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	1		1		5		2		9	
Diphtheria	3				3		5	1	11	1
Dysentery:										
Amebic			1		2		3		6	1
Bacillary	2				4				6	
Malaria [1]	7		6	1	57		54	3	124	4
Measles	1		2		3		2		8	
Meningitis, meningococcus					1				1	
Mumps					3		2		5	
Paratyphoid fever	1	1			1		1		3	1
Pneumonia (all forms)		14		4	44			4	[2] 44	22
Relapsing fever							1		1	
Tuberculosis		18		8	1	1		7	[2] 1	34
Whooping cough					2				[2] 2	

[1] 28 recurrent cases.
[2] In the Canal Zone only.

* * *

DEATHS DURING WEEK ENDED SEPTEMBER 29, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Sept. 29, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,380	7,993
Average for 3 prior years	8,280	
Total deaths, first 39 weeks of year	349,928	351,519
Deaths under 1 year of age	649	608
Average for 3 prior years	634	
Deaths under 1 year of age, first 39 weeks of year	23,700	24,084
Data from industrial insurance companies:		
Policies in force	67,305,751	66,743,450
Number of death claims	12,488	13,221
Death claims per 1,000 policies in force, annual rate	9.7	10.4
Death claims per 1,000 policies, first 39 weeks of year, annual rate	10.2	10.1

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 15, 1945.—During the week ended September 15, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox				19	37	11	6	24	18	115
Diphtheria		10	3	24	1	2				40
Dysentery:										
Amebic					4					4
Bacillary									1	1
German measles					7	1	1	1	3	13
Influenza		10			11	2				23
Measles			2	34	34	1	2	4	18	95
Meningitis, meningococcus				1		1				2
Mumps				25	21	11	9	20	8	94
Poliomyelitis		1		3	14		1		4	23
Scarlet fever		2	28	40	27	8	5	9	10	129
Tuberculosis (all forms)		24	5	81	53	11	46	30	49	299
Typhoid and paratyphoid fever		1	1	8	3	1		3	1	18
Undulant fever				2	1				1	4
Venereal diseases:										
Gonorrhea	1	26	44	106	233	58	36	28	75	607
Syphilis		6	12	87	74	4	12	9	34	238
Whooping cough				124	19	5	1	20		169

CUBA

Habana—Communicable diseases—4 weeks ended September 15, 1945.—During the 4 weeks ended September 15, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	11		Typhoid fever	57	4
Tuberculosis	10	1			

Provinces—Notifiable diseases—4 weeks ended September 8, 1945.—During the 4 weeks ended September 8, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	2	6	8		20	37
Diphtheria		10	1			5	16
Hookworm disease		20					20
Leprosy		1	1			3	5
Malaria	1		3	2	4	221	231
Rabies					1		1
Tuberculosis	20	23	18	31	16	39	147
Typhoid fever	35	84	40	128	59	108	454

[1] Includes the city of Habana.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January—July 1945	August 1945	September 1945—week ended—				
				1	8	15	22	29
ASIA								
China:								
Hupeh Province	C	14	P					
Kweichow Province—Kweijang	C	12	P					
Szechwan Province—								
Chengtu	C	9						
Chungking	C	8,000						
Hsin Chiaco	C	1						
Hsin Kai Shih	C	1						
Kiang Pei	C	1						
Kweyang	C	26						
Nei Kiang	C	200						
Pi Shan	C	40						
Yunnan Province	C	P	P					
India	C	168,577						
Bombay	C	62	14	3	4			
Calcutta	C	4,663	196	38	17			
Cawnpore	C	149	38	1	2			
Chittagong	C	17	2					
Delhi	C	162	87		16			
Madras	C	49	3					
Vizagapatam	C	23	6	2				
Indochina: Cochinchina	C	P						

PLAGUE

[C indicates cases; D, deaths]

Place		January—July 1945	August 1945	September 1945—week ended—				
				1	8	15	22	29
AFRICA								
Algeria	C	[1] 12	1					
Basutoland	C	4						
Bechuanaland	C	7						
Belgian Congo	C	11	6					
British East Africa:								
Kenya	C	[2] 36	12	11				
Uganda	C	6						
Egypt	C	200	13			2		
Ismailiya	C	82	1					
Port Said	C	68	12			2		
Suez	C	19						
French West Africa	C	5						
Dakar	C	1						
Madagascar	C	113	5					
Morocco (French)	C	675	112				[3] 10	
Senegal	C	54						
Tunisia	C	3						
Union of South Africa	C	22						
ASIA								
China:								
Foochow	C	30						
Yunnan Province [4]	C	25						
India	C	18,623						
Iraq	C	34						
Palestine	C	10	4		1			
Plague-infected rats		17						
EUROPE								
France: Corsica—Ajaccio	C	8						
Great Britain: Malta	C	[5] 18	7	4	13	5	2	
Italy [6]	C					12	2	
Portugal: Azores	C	8	4		1			
Spain: Canary Islands	C	1						
NORTH AMERICA								
Canada: Alberta Province: [7]								
Plague-infected squirrels		2						
SOUTH AMERICA								
Argentina:								
Buenos Aires Province—Plague-infected rats		2						
Santiago del Estero Province	C	1						
Bolivia: Santa Cruz Department	C	[8] 75						
Brazil: Pernambuco State	C	26						
Ecuador:								
Canar Province	C		2					
Chimborazo Province	C	6						
Loja Province	C	13	5					
Peru:								
Ancash Department	C	1						
Ica Department	C	[9] 4						
Lambayeque Department	C	13						
Libertad Department	C	11						
Lima Department	C	13						
Otuzco Department	C	3						
Piura Department	C	4						
OCEANIA								
Hawaii Territory	D	[10] 1						
Plague-infected rats [11]		12				1		

[1] Includes 4 cases of pneumonic plague.
[2] Includes 5 suspected cases.
[3] For the period Sept. 1-20, 1945.
[4] Information dated July 5, 1945, stated that from April 1944 to May 1945, 85 deaths from plague had occurred in the mountainous region south of Kunming, China.
[5] Includes 4 suspected cases.
[6] The report of plague in Palermo, Italy, which appeared on p. 1231 of the PUBLIC HEALTH REPORTS of Oct. 12, 1945, is in error. These cases occurred in Malta and had been reported previously.
[7] During the month of June 1945, plague infection in fleas was reported in Alberta Province. For the week ended July 28, 1945, plague infection was also reported in 6 pools of fleas in Alberta Province. For the week ended Aug. 11, 1945, 2 pools of plague-infected fleas were reported in Alberta Province, Canada.
[8] Includes 6 suspected cases.
[9] Includes 1 suspected case.
[10] Previously reported as a case, death occurring on June 2, 1945.
[11] Plague infection was also proved positive in a pool of 5 mice on Jan. 4, in a pool of fleas on Feb. 14, and in a pool of 40 fleas on Mar. 14, 1945.

SMALLPOX

[C indicates cases]

Place		January—July 1945	August 1945	September 1945—week ended—				
				1	8	15	22	29
AFRICA								
Algeria	C	165	25					
Angola	C	101						
Basutoland	C	344	1					
Belgian Congo	C	5,255	332	159				
British East Africa:								
Kenya	C	178	6	18		91	91	
Nyasaland	C	9				51	5	
Tanganyika	C	3,234	161	330				
Uganda	C	865	14		15			
Cameroon (French)	C	383	383		8			
Dahomey	C	117	34		15			
Egypt	C	1,049	9	6				
French Equatorial Africa	C	1,536	5					
French Guinea	C	1,476	39		7			
French West Africa: Dakar District	C	390	2		2			
Gambia	C	82						
Gold Coast	C	54	88	21				114
Ivory Coast	C	468	24		2			
Libya	C	6	2					
Mauritania	C	83						
Morocco (French)	C	1,107	158				[1] 75	
Nigeria	C	3,402						
Niger Territory	C	472	6		21			
Rhodesia, Northern	C	1,440	641	1,529				
Senegal	C	487	4					
Sierra Leone	C	31						
Sudan (Anglo-Egyptian)	C	[2] 3						
Sudan (French)	C	1,926	129		19			
Togo (British)	C	25						
Togo (French)	C	482	14					11
Tunisia	C	2						
Union of South Africa [3]	C	1,270	14		18	9		
ASIA								
Arabia	C	20						
Ceylon	C	[4] 416	111	14				27
China	C	1,136						
India	C	217,968						
Iran	C	390						
Iraq	C	36	2	1				
Syria and Lebanon	C	8	1					
Turkey (see Turkey in Europe.)								
EUROPE								
Belgium	C	1						
France	C	[5] 4						
Great Britain: Scotland	C	[6] 2						
Italy	C	1,582	11	2				
Sicily	C	9						
Portugal	C	23	2					
Spain	C	30			1			
Canary Islands	C	1						
Turkey	C	291		1				2
NORTH AMERICA								
Canada	C	6						
Guatemala	C	4						
Honduras	C	8						
Mexico	C	1,066						
Nicaragua	C	[7] 136						
SOUTH AMERICA								
Bolivia	C	493	235					
Brazil	C	[7] 153	[7] 17					
Colombia	C	258	21	8				
Ecuador	C	22	14					
Paraguay	C	1						
Peru	C	39						
Uruguay	C	67						
Venezuela	C	[7] 509	[7] 51			[7] 23	[7] 18	[7] 10

[1] For the period Sept. 1–20, 1945.
[2] Imported.
[3] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Unión of South Africa.
[4] Includes some cases of chickenpox.
[5] Corrected figure.
[6] Includes 1 imported case.
[7] Includes cases of alastrim.

TYPHUS FEVER*

[C indicates cases]

Place		January—July 1945	August 1945	September 1945—week ended—				
				1	8	15	22	29
AFRICA								
Algeria	C	954	59					
Basutoland	C	51						
Belgian Congo [1]	C	166	43	9				
British East Africa: Kenya	C	27	3					
Egypt	C	15,008	263	8	48	3	10	
French West Africa: Dakar [1]	C	18						
Gold Coast	C	1						
Libya: Tripolitania	C	17	1					
Morocco (French)	C	6,336	556				[2] 220	
Morocco (Spanish)	C	5	1					
Nigeria	C	26						
Rhodesia, Northern	C	31						
Sierra Leone [1]	C	3						
Tunisia	C	379	1					
Union of South Africa	C	517			4	3		
ASIA								
China	C	1,332						
India	C	23						
Iran	C	824						
Iraq	C	212	16	2	4	2		4
Palestine [1]	C	84	1					
Syria and Lebanon	C	12						
Trans-Jordan	C	42	1					
Turkey (see Turkey in Europe).								
EUROPE								
Albania	C	100						
Austria	C	46						
Belgium	C	157						
Bulgaria	C	928						
Czechoslovakia	C	282	7					
Denmark	C	145	1					
Finland	C	26						
France	C	263	4					
Germany	C	7,872						
Gibraltar	C	4						
Great Britain	C	[3] 21						
Malta and Gozo [1]	C	15						
Greece	C	85	69					
Italy	C	179						
Netherlands	C	158						
Portugal	C	47	2					
Rumania	C	[4] 7,831						
Spain	C	13	11					
Sweden	C	223	2	1				
Switzerland	C	2						
Turkey	C	2,305	86	19	14	12	3	9
Yugoslavia	C	1,194						
NORTH AMERICA								
Canada [1]	C	1						
Costa Rica [1]	C	6	1					
Cuba [1]	C	8	2					
Guatemala	C	1,396	432					
Jamaica [1]	C	24	11					
Martinique [1]	C		1					
Mexico	C	1,058						
Panama (Republic)	C	3						
Puerto Rico [1]	C	112	32	1	4	3		
Virgin Islands [1]	C	8						
SOUTH AMERICA								
Argentina	C	6						
Bolivia	C	318	93					
Brazil	C	3						
Chile [1]	C	332	46					
Colombia	C	20						
Curacao	C	1						
Ecuador	C	310	95					
Peru	C	361						
Venezuela [1]	C	75	6					
OCEANIA								
Australia [1]	C	80	5					
Hawaii Territory [1]	C	64	6		4	2		

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reports cases as murine type.
[2] For the period Sept. 1-20, 1945.
[3] Includes imported cases.
[4] For the period Jan. 1-20, 1945.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January—July 1945	August 1945	September 1945—week ended—				
				1	8	15	22	29
AFRICA								
Gold Coast:								
Nsawam	C	[1] 3						
Takoradi	C	1						
Tamale	C					[2] 1		
Winneba	C	1	[1] 3					
Ivory coast:								
Gaoua	C	1						
Guiglo	C	1						
Sierra Leone: Moyamba	C	2						
SOUTH AMERICA								
Bolivia:								
Beni Department	C	1						
La Paz Department	C	1						
Brazil:								
Goiaz State	D	76						
Minas Geraes State	D	25						
Para State	D	1						
Colombia:								
Magdalena Department	D	2						
Santander do Norte Department	D	16						
Peru:								
Cuzco Department	C	3						
Loreto Department	C	1						
Venezuela:								
Bolivar State	C	1						
Merida State	C	2						
Tachira State	D	20						
Zulia State	C	6				1		

[1] Includes 1 suspected case.
[2] Suspected.

×

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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INCREASE OF RAT INFESTATION ON VESSELS COMING TO NEW YORK[1]

By ROBERT OLESEN,[2] *Medical Director, United States Public Health Service*

The destruction by hydrocyanic acid gas of considerable numbers of rats on vessels coming to New York from foreign ports has directed attention to the increased infestation of such craft and the potential danger to the United States. The necessity for constant surveillance over these vessels and their prompt fumigation when this procedure is indicated is clearly shown by recent experiences. Among the infested vessels lately encountered in New York was a freighter, which arrived with a history of having visited several foreign ports known to be or suspected of being plague infected. This vessel had called at several such places. Upon arrival in New York a preliminary routine survey made by trained inspectors during the routine quarantine inspection disclosed evidence of "many rats." The vessel carried an unvisaed exemption certificate from the authorities in a foreign port, certifying that conditions in that port and on the vessel were satisfactory to the officials.

In New York a further and more detailed sanitary inspection was made to determine whether the preliminary estimate of infestation was sufficient to warrant fumigation of the vessel. An experienced sanitary inspector from the New York quarantine station found that the infestation was extensive, a preliminary estimate of "more than 200 rats" being made.

The vessel was fumigated with hydrocyanic acid gas on February 27, 1945, the result being the destruction of at least 384 rats. All of the dead rodents were found in the holds and none was discovered in living quarters, storerooms, and other compartments of the vessel.

In this connection it has been interesting and also disconcerting to note a considerable increase in the number of rats destroyed by fumigation on vessels during the past few months. Apparently there has been a relaxation in repressive efforts in several of the foreign countries

[1] From the Foreign Quarantine Division.

[2] Chief Quarantine Officer, U. S. Quarantine Station, Rosebank, N. Y. (Deceased, Aug. 16, 1945.)

visited by vessels prior to entry into United States ports. Among these untoward results the following specific instances (table 1) may be mentioned after inspections and subsequent fumigations in New York.

TABLE 1.—*Excessive numbers of rats recovered after fumigation, in New York, of several vessels from foreign ports, during January, February, and a portion of March 1945*

Date of arrival	From—	Number of rats	
		Estimated	Recovered
Jan. 15	Alexandria and Liverpool	125	134
Jan. 24	Alexandria	20	98
Feb. 8	Oran	50+	148
Feb. 17	Wales	35	76
Feb. 24	Casa Blanca	200+	384
Mar. 1	do	75	67
Mar. 3	Port Said	50	76
Mar. 4	Liverpool	35	188

The rats obtained in these and other fumigations were subjected to autopsy in the laboratory of the New York Quarantine Station. Experimental animals were also inoculated with portions of liver and spleen to determine whether plague infection was present. Fortunately these inoculations were without result.

Without more tangible evidence it would manifestly be unfair to allege that vigilance over rat infestation of vessels has been dangerously relaxed in certain foreign ports. However, it can be said that the situation whereby considerable numbers of rats are permitted to infest vessels destined for United States ports is potentially dangerous to the public health and is causing apprehension. Therefore, sanitation officers generally, and particularly in the United States, should increase their efforts to discover and destroy rodents on vessels.

In addition to the major incidence of rat infestation noted in table 1, the usual number of fumigations was performed on other vessels. Thus, in January 1945 there were 18 other fumigations which resulted in the extermination of between 5 and 30 rats on each vessel. In February there was a total of 22 fumigations, with a total "kill" of 855 rats, most of these being recovered on the 3 vessels fumigated during the month. Lesser numbers of rats were destroyed on the remaining 19 vessels.

INCREASE OF RAT INFESTATION ON OIL TANKERS [1]

By ROBERT OLESEN, *Medical Director* [2] and J. L. STONE, *Administrative Assistant, United States Public Health Service*

Prior to the present war it was generally true that oil tankers were less liable to become rat infested than were other cargo vessels. The

[1] From the Foreign Quarantine Division.

[2] Chief Quarantine Officer, U. S. Quarantine Station, Rosebank, N. Y. (Deceased, Aug. 16,1945.)

records of the New York quarantine station show, however, that during the war there has been a significant increase in rat infestation of tankers.

The cargo-carrying space of the conventional type of tankers consists of huge tanks instead of holds. There is, therefore, little opportunity for rat infestation. During the war, in order to increase the cargo-carrying capacity of tankers, additional freight space has been provided by the erection of elevated steel racks running the length of the main decks of such vessels, well above the pipe lines, valves, and tank tops. On these racks are carried planes, boats, engines, freight cars, and other heavy equipment for the war fronts. In order to obtain and load this extra cargo it is necessary to spend considerable time at docks not ordinarily touched during routine tanker operations. Moreover, such a vessel must call at foreign ports that are not ordinarily visited during oil-carrying operations, thereby rendering the vessel more liable to infestation by rodents at both ends of the voyage.

Another factor contributing to rat infestation of tankers is the practice of permitting garbage to accumulate on deck during a stay in port. Ordinarily such refuse is dumped overboard after the vessel leaves port. In some instances garbage is kept in receptacles on the deck of the vessel while in port, being removed and burned in incinerators on the adjoining dock. However, such facilities are not generally available, necessitating the accumulation of garbage on deck awaiting disposal at sea. It is obvious that accumulation of garbage on the deck of a vessel lying at a rat-infested dock will result in rat infestation of the vessel.

That infestation of oil tankers does occur is apparent when the rat inspection and fumigation records compiled in New York are examined. At this point it may be well to explain that fumigations in New York are based entirely upon preliminary inspections and estimations of rats made by skilled operators of the Public Health Service. Ordinarily vessels are inspected at least twice a year and more frequently when requests are received or infestation is suspected. The manner in which inspections are made and infestation determined has been described (*1*).

RESULTS OF FUMIGATIONS OF TANKERS

In table 1 are shown the results of fumigations of tanker and other cargo-carrying vessels during the fiscal years 1942, 1943, and 1944. An examination of this table discloses that only two oil tankers were found to be rat infested in 1942. In the following year, there was a slight but significant increase in the number of tankers requiring fumigation for rat destruction, the average number of rodents destroyed on each being 27. In the fiscal year 1944, coinciding with the more general use of cargo racks above the decks, and increased fre-

TABLE 1.—*Results of fumigation for destruction of rats on oil tankers and other vessels in the port of New York during the fiscal years 1942, 1943, and 1944, with numbers of rats estimated prior to fumigation and numbers of rats recovered after fumigation with hydrocyanic acid gas*

	Fiscal year								
	1942			1943			1944		
	Number of fumigations	Rats estimated	Rats recovered	Number of fumigations	Rats estimated	Rats recovered	Number of fumigations	Rats estimated	Rats recovered
Tankers from infected ports	1	15	19	1	15	19	19	242	376
Tankers from clean ports	1	14	2	3	38	89	6	75	51
All other vessels	116	2,700	3,768	148	3,391	4,880	184	2,725	3,802
Total	118	2,729	3,789	152	3,444	4,988	209	3,042	4,229

quency of infested docks here and abroad, there was a significant increase in the number of rat-infested tankers. The average number of rats per fumigation, however, decreased to 17.

It is also worthy of note that an increased number of vessels other than tankers also required fumigation for rat destruction. Thus, there were 116 fumigations of cargo-carrying vessels and a few fumigations of passenger vessels in 1942, 148 in 1943, and 184 in 1944. The average number of rats per fumigation was approximately 33 in 1942 and in 1943, but decreased to 21 in 1944.

At this time it was realized that tankers, like other cargo-carrying vessels, are susceptible of considerable infestation. It was also apparent that the older tankers, often constructed without benefit of modern ratproof design, were more frequently infested than the newer vessels of the same general type. Moreover, as might be expected, infestation occurred in living quarters, storerooms, and spaces considerably removed from tanks in which oil was carried.

INFESTATION ON TANKERS

Much of the infestation of oil tankers is due to construction methods in vogue prior to the so-called ratproof-construction era. With the older construction methods, food other than garbage is accessible to rats on tankers, notably in the provision storerooms, which are frequently entered by rats through open doors and openings around beams, pipes, and cables. Then too, rats often gnaw through the wooden sheathing of partitions enclosing storeroom spaces. Double walls, when present, provide harborages in the sheathing of quarters, pantries, and similar spaces.

When present on a tanker, the bridge deck space furnishes an attractive rat harborage. This space opens on the main deck, usually through four large doors, which too often are left open. In many instances the provision storeroom occupies a portion of this space. It

is also the practice to store ship's gear in the bridge deck space, thereby affording additional harborages for rats.

Although the spaces already mentioned are the more usual places in which rats may be expected to live on tankers, it has been rather surprising to find that other portions of these vessels may also be infested. Thus, while the majority of rodents killed by fumigation have been found where food was stored or available, many others were discovered in living quarters and such comparatively inaccessible and unattractive locations as lifeboats. The various locations where dead rats were found after fumigation are shown in table 2. That rats are

TABLE 2.—*Places in which rats were recovered after fumigations of oil tankers and the numbers in each at New York, during the fiscal years 1942, 1943, and 1944*

Locations	Fiscal year		
	1942	1943	1944
No. 1 hold	1		31
Bridge deck space	11	15	167
Forepeak and storeroom	3		14
Afterpeak and storeroom			44
Lifeboats			3
Galley and bakery		25	35
Saloon and pantry			11
Provision storeroom		58	86
Messrooms		4	6
Quarters (crew's)	2		9
Quarters (officers')	4	6	21
Total	21	108	427

becoming a sanitary and health problem on vessels heretofore regarded as relatively free of such infestation is a matter requiring close attention from those charged with ship sanitation and disease prevention.

RAT DESTRUCTION ON VESSELS

It is interesting to examine the data set forth in table 3, in which the number of rats destroyed by means other than fumigation is recorded. It will be noted that the greatest numbers of rats were killed by fumigation, although the destruction per vessel in 1944 was lower than in 1942. Additional rodents were destroyed by such relatively unorthodox methods as physical violence, i. e., clubbing and the

TABLE 3.—*Rats killed by trapping, fumigation, and other means on certain vessels in New York during the fiscal years 1942, 1943, and 1944*

Mode of destruction	Fiscal year		
	1942	1943	1944
Trapping	2, 183	1, 847	1, 546
Fumigation	3, 799	4, 988	4, 229
Other means	202	368	570
Total	6, 174	7, 203	6, 345

like, as in the case of litters of young discovered during routine inspections. In many instances rodents are destroyed during the course of preliminary inspections, some of which disclose insufficient infestation to warrant fumigation. According to the best authority available there is little to justify the belief that any considerable number of rats on vessels are destroyed by dogs or cats.

CORRECTIVE MEASURES

With relatively slight modifications the general measures employed in ship ratproofing may be adapted to tankers. Thus, all pipe and ventilating openings into provision storerooms should be surrounded by 16-gage wire mesh, the openings of which are not more than one-half inch square. The openings through which pipes and cables pierce wooden sheathing should be surrounded by 6-inch metal collars of 18-gage sheet metal. If a provision storeroom door is made of steel it should fit snugly so that no opening greater than one-half inch is left. When a wooden door is used there should be a facing of 18-gage sheet metal. All edges of wooden enclosures and all wooden sheathing and double doors in quarters, pantries, saloons, and messrooms should be flashed with strips of 18-gage metal at least 6 inches wide at all gnawing edges. Metal collars should be installed around all pipes and cables where such utilities enter rat-habitable spaces.

Excess ship's stores, always attractive to rats, should be stowed in an orderly manner and preferably elevated from decks. Particular attention should be devoted to the exclusion of rats from pantries, messrooms, and galleys through cleanliness and protection of foodstuffs. Provision for safeguarding garbage in closely covered metal cans prior to disposal is important especially on vessels on which garbage is kept on board awaiting disposal at sea.

Most of the corrective measures mentioned may be instituted by the crews of tankers without outside assistance, particularly when an energetic and resourceful ship's carpenter is available or resourceful shore personnel is maintained. In any event it is usually possible to "sell" the idea of ratproofing to the agents and owners of such vessels by pointing out the saving that can be effected by preventing the destruction of food and ship's stores.

In addition to the measures already mentioned, it is usually helpful to suggest the acquisition and use of at least 1 dozen approved rat traps, employing varied baits and setting the traps where the rodents are most likely to infest the vessel. In attempting to eradicate rats by trapping it should be remembered that this effort may fail when food is available outside of the traps. Many suggestions for successful trapping have been given in a special publication (*2*).

PREVENTION

That recently constructed tankers are practically immune to rat infestation has been amply demonstrated by the experience at this port during the present war. Not one recently constructed tanker vessel of this type has required fumigation. The ratproofing of new vessels is supervised by trained sanitary inspectors of the Public Health Service while such craft are under construction. This activity forms a separate chapter of repressive measures at the present time and deserves consideration because of the favorable influence exerted upon sanitary effort.

REFERENCES

(*1*) Akin, C. V., and Sherrard, G. C.: Ship fumigation by observed rodent infestation. Pub. Health Rep., **42**: 861–867 (1927).

(*2*) Trapping rats on ships. Pub. Health Rep., **55**: 1057–1061 (1940). (Reprint No. 2170.)

JOINT REPORT ON PROPOSALS FOR A NATIONAL RESEARCH FOUNDATION [1]

The joint meeting of the Councils was convened September 28, 1945, to consider specifically the relation of the Public Health Service to the report made by Dr. Vannevar Bush to the President, and to pending legislation pertaining to the implementation of the report.

Each member of the Councils, at the request of Surgeon General Parran, expressed his opinion regarding the relationship of the Public Health Service with the National Research Foundation or any overall research body which the pending bills would create.

The consensus of the Councils may be summarized as follows:

I. The Bush report is a magnificent and distinguished document which outlines a plan for stimulating basic research in civilian research institutions and for continuing the close and profitable cooperation between civilian and governmental research agencies. To implement the recommendations of the report, the formation of a new body, the National Research Foundation, was proposed. The report expressed the belief that the existing governmental research agencies should be further developed and provided with more funds. It further emphasized that, although a new independent agency is needed to develop and foster research, this new agency should in no way conflict with existing governmental agencies, but should "supplement the research activities of these agencies in a valuable manner." The report proposes that a National Research Foundation would provide for the training of scientific personnel, promote basic research, and cooperate with governmental research agencies. These aims and views expressed in the report were endorsed by the Councils.

II. (*a*) The Councils agreed that pending legislation is not clear

[1] National Advisory Health Council and National Advisory Cancer Council of the Public Health Service.

regarding the relation of the proposed new body to the budgetary and research policies of existing governmental agencies. Although the various bills may be interpreted broadly as carrying out the intent of the Bush report, the omission of specific language may permit the interpretation that the National Research Foundation would exercise direct or indirect control over the budgetary and research policies of the existing agencies. The Bush report visualized only a consultative, advisory, and cooperative relationship.

(*b*) In the firm belief that the Public Health Service should retain autonomy in its research activities, the Councils were of the opinion that pending legislation should be clarified.

(*c*) Under existing law (P. L. 410, sec. 301, par. (c) and (d)), the Public Health Service has broad authority to coordinate and conduct research upon the physical and mental impairments and diseases of mankind, to allocate grants-in-aid for such research to other institutions, upon recommendation of its advisory councils, and to provide fellowships for the training of scientific personnel in these fields.

In this connection, the Councils recommended that the Public Health Service continue to develop and expand its research and training programs, as authorized by Congress, both in its own facilities and through grants-in-aid to universities and other institutions.

III. A study of the pending legislation shows lack of agreement in regard to the representation of governmental agencies on the board or executive organization of the proposed National Research Foundation. In the medical portion of the Bush report (pt. II, p. 57) it is stated that "men who are experienced in research and who understand the problems of the investigator should administer the agency and its policies." The Councils agree with the intent and implications of this statement, but they believe that governmental agencies should be represented on such boards and advisory committees as may be set up in or by the new body.

This opinion is based on the reasonable assumption that governmental agencies would appoint as their representatives men "who are experienced in research;" but it appears advisable that this requirement should be clearly expressed in the proposed legislation.

IV. In general, it was the opinion of the Councils that appropriate legislation can maintain in peacetime the cooperative relationship which was maintained throughout the war among governmental agencies, the Office of Scientific Research and Development, and civilian research institutions. In the establishment of a National Research Foundation, the Councils favored the appointment of a board to carry out the powers and purposes of the Foundation, and the choice by that board of its own chairman and other officers. The Councils felt, however, that members of the board should be selected from among persons nominated to the President by the National Academy of Sciencies and governmental research agencies.

It was the opinion of the Councils that either (*a*) a new bill should be written as a cooperative enterprise of all governmental agencies concerned and the appropriate committee of the National Academy of Sciences; or (*b*) that the defects of proposed legislation be remedied by amendments such as those recommended by the Senate Committee on Naval Affairs in its reports on S. 825 (Rept. No. 551, Calendar No. 549), July 28, 1945, as follows:

1. The Board shall in no way relieve governmental agencies of their responsibility for, or authority over, research and development work under their legal cognizance. This Act shall not be construed as superseding, curtailing, or limiting any of the functions or activities of existing governmental agencies now authorized to engage in scientific research and development, or as authorizing the Board to exercise any supervisory direction or power of regulation over such functions or activities in any manner. Funds allocated by the Board to other governmental agencies shall be utilized for projects designated by the Board and undertaken on its behalf, and shall be in addition to, and not in lieu of, funds regularly appropriated to the agency concerned.
2. Wherever practicable the Board shall make use of the facilities and services of governmental agencies legally available for scientific research or development work, and wherever practicable it shall conduct research or development projects related to the legally authorized functions or activities of any governmental agency through or in cooperation with such agency. The said agencies are hereby authorized to make such facilities and services available to the Board and to participate in the conduct of its projects, on terms mutually agreeable to the Board and to the agency concerned. The Board shall not operate laboratories under its own auspices.

V. To implement the foregoing opinions, the following motions were passed unanimously by the Councils:

1. That proposed legislation should be amended to include statements to the effect that autonomy in the development and conduct of their research programs should be maintained by those governmental agencies now engaged in such activities.
2. That there should be governmental representation on such boards and advisory committees as may be set up in connection with the proposed National Research Foundation.
3. That the joint report and recommendations of the Councils be brought to the attention of other scientific groups, both public and private, now considering the proposals for a National Research Foundation.

A MODIFIED RABBIT BOX TRAP FOR USE IN CATCHING LIVE WILD RATS FOR LABORATORY AND FIELD STUDIES [1]

By Curt P. Richter and John T. Emlen, Jr.

Several years ago, while testing a variety of chemical compounds for their possible use as rat poisons, we were confronted with the

[1] From the Psychobiological Laboratory, Phipps Psychiatric Clinic, Johns Hopkins Hospital. The work described in this paper was done under a contract, recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Johns Hopkins University, and was aided by the Rodent Control Division of the Bureau of Street Cleaning, Baltimore, Md.

problem of working out a simple and efficient method of obtaining a constant supply of live wild rats for laboratory tests.

Various traps were tested, which were either available on the market or were obtained through the courtesy of the Fish and Wildlife Service, United States Department of the Interior.[2] Extensive tests were made with several wire and sheet-metal box traps. The time required for the rats to become adjusted to these traps and the low catch usually obtained made it impractical to use them for catching large numbers of live wild rats. Also, a considerable amount of mechanical repair was required. While working in the field with these traps we came in contact with people who were using traps of their own construction to rid their houses or stores of rats. Excellent results were reported when some form of a wooden box trap of a type used for catching rabbits was employed. It was decided, therefore, to use a similar box trap and to test it out in large numbers on a wide scale. The one that we used proved to be very effective and, for the time being, has solved our problem of catching wild rats for laboratory studies.

Figure 1 shows a drawing of this trap, which consists of four parts: a box, a trap door, a trigger stick, and a trigger wire. The box is made of undressed lumber, either yellow pine or poplar, and the top is covered with a heavy ½-inch wire-mesh hardware cloth. A block of wood 2″ x 2″ x 4½″, firmly fastened to the wire cloth with two large screws and broad washers, serves both as a handle for carrying the trap and as a fulcrum for the trigger stick. The door slides freely between strips of wood nailed to the inside of the box. The door hangs from the trigger stick by a loop of string. The trigger stick, ½″ x ½″ x 10″, is sharpened almost to a point at one end and to a chisel edge at the other. The wire trigger made of a stiff 16-gage wire has two ¼-inch notches, one near the top and one near the middle, and has a hook at the lower end to hold the bait. The top notch engages with the chisel end of the trigger stick; the middle notch hooks under one of the cross wires in the wire-mesh top of the trap. When properly set a gentle pull on the trigger wire disengages the trigger stick and allows the door to drop. To insure a sensitive, quick response of the trap it is important that the door should hang freely between the guides and not be pulled either forward or backward by the loop over the trigger stick.

The traps are simple to construct, inexpensive,[3] and require very little upkeep. After exposure to rain the trap door may become warped and have to be planed to the proper size again, or the wooden guides for the door may have to be replaced after the rats have gnawed on them, or, after heavy use, the fulcrum post may have to be reset or replaced.

[2] Mr. J. Spencer, of Fish and Wildlife Service, loaned us 25 Japanese wire cage traps.

[3] The traps were constructed by schoolboys at a cost of approximately $1.00 each. We want to thank Mr. Stanley J. Pawelek, Supervisor of Industrial Education, for arranging to have the boys make the traps for us.

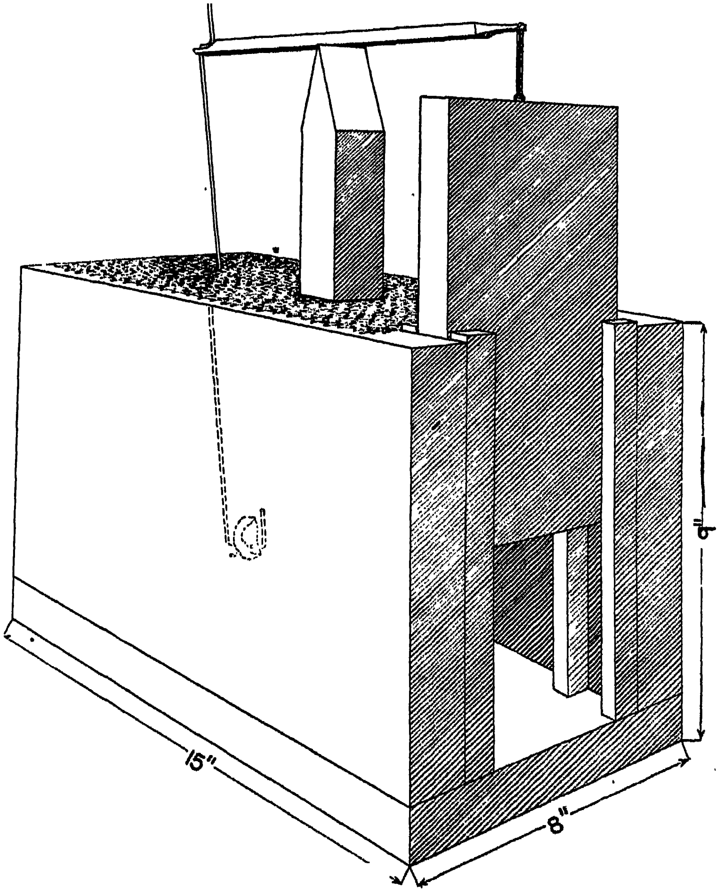

FIGURE 1.—Drawing of modified rabbit trap set ready to be sprung. A slight pull of the baited hook will release the trap door.

To set the traps in the field a small piece of bread or apple is placed on the hook of the trigger and a horse-feed mixture (oats, corn, and alfalfa, impregnated with molasses) is spread evenly over the floor.[4]

The effectiveness of the traps can best be demonstrated by the records obtained from an exhaustive trapping campaign carried out in 89 city blocks. The following procedure was used in trapping rats in a square block:

On the day before the traps were distributed all available rat food (garbage, etc.) was removed by the Bureau of Street Cleaning from the alleys and yards, and the inhabitants of the block were asked not to leave any food accessible to rats during the trapping period. Then, depending on the results of a survey of rat holes, runs, droppings, etc., from 100 to 300 traps were placed in the alleys, yards, garages, and cellars. Each day thereafter for several weeks the traps were checked, trapped rats were removed, and the hooks were rebaited as needed. All burrows

[4] Mr. Henry Cordler, of the Rodent Control Division recommended the use of this molasses mixture, which has proved to be an essential feature of the trapping method.

were closed. Periodic surveys of fresh rat signs showed the progress of extermination, and trapping was not terminated until all burrows remained closed and no other signs of rats remained.

Figure 2 shows a typical trapping record taken from a fairly heavily infested block. Two hundred and sixty-five traps were used in this block. The records show the accumulated total catch and the total number of rats caught each day. The highest catch was obtained on the first night, 70 rats, and thereafter the catch fell off at a rapid but fairly constant rate. Trapping was continued for 13 days. At this time the catch totaled 225 rats. Thus, 70 rats, or 31 percent of the total number of rats caught in the block, were trapped during the first night; 45 rats, or 20 percent, the second night; 28 rats, or 12 percent, the third night; 33, or 15 percent, on the fourth night. In 4 days 176 rats, or 78 percent of the total, were caught. This gives a good measure of the efficiency of the traps.

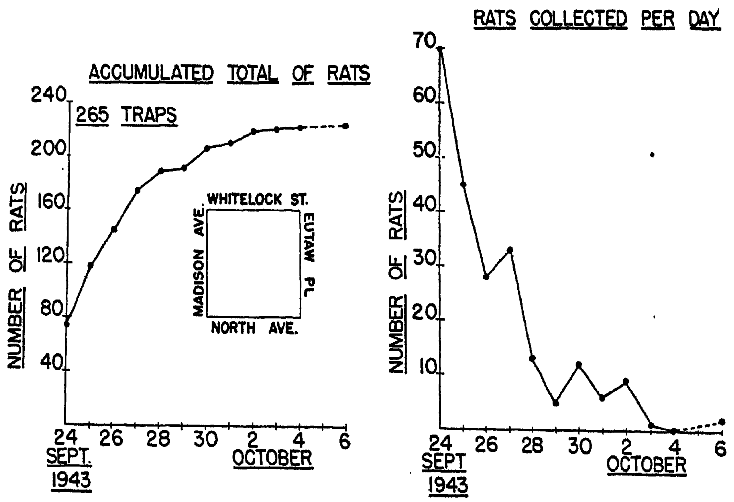

FIGURE 2.—Trapping records for a sample square block in Baltimore.

From this record it will be seen that rats entered the traps freely the first night and did not avoid them for several days or even weeks as they did the metal or wire traps. Actually, on many occasions rats were caught in the traps during full daylight, while the men were still in the same yard setting other traps. It is likely that the undressed lumber and the absence of any shiny parts on the trap account in part for the high efficiency of this trap.

Further evidence for the effectiveness of the traps is that two or three rats are commonly caught together and as many as nine rats have been taken at the same time in a single trap. Frequently, a mother and young have been caught together. Apparently the rats go into the traps primarily to eat the grain mixture on the floor and

then only accidentally discover the bait on the hook. Rats have been observed crowding into a trap, apparently for warmth and shelter.

Each day as the traps are serviced the live rats are transferred either to a large collection box or to small metal traps for carrying to the laboratory. Figure 3 shows a drawing of the collection box. It is made of wood 16″ x 20″ x 12″, with a hinged door on top made of wire cloth. A door 5″ x 5″ is cut into the box at the one end and near the bottom. A wire cage 5½″ x 5½″ x 5½″ is built over this hole on the

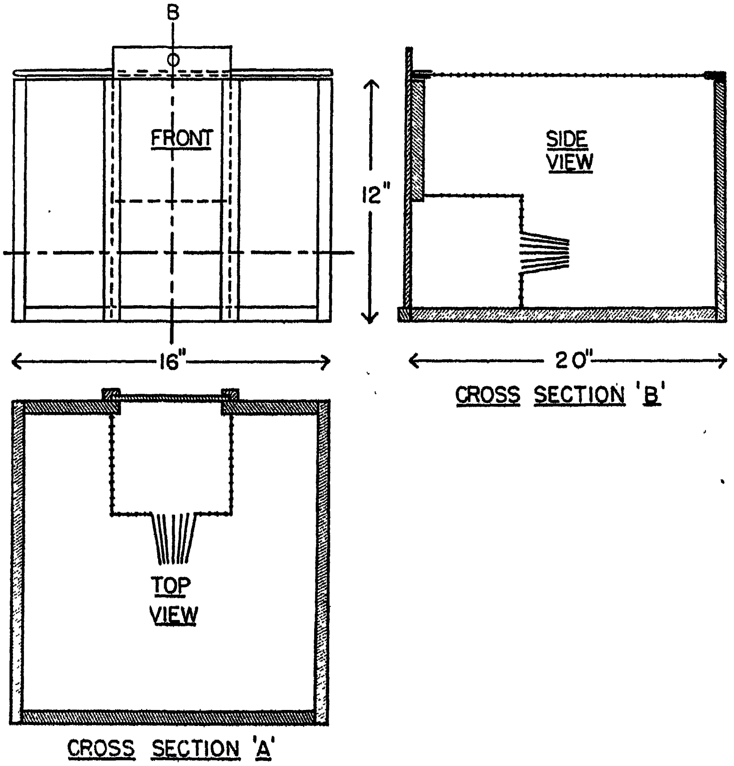

FIGURE 3.—Drawing of collection box used to collect rats from rabbit traps.

inside and a one-way trap cone connects this cage with the main part of the box. Thus, to transfer a rat to this box the door of the rabbit trap is placed opposite the opening. When the door is opened the rat runs out into the wire cage inside the collection box and from there on through the one-way opening to the inner compartment. As many as 25 rats can be confined in the collection box at one time. This collection box can also be used as a gassing chamber simply by covering it with a wet cloth and pumping cyanide gas through a small hole cut in one side.

A metal trap [5] is used to transfer single live rats. It is 12″ x

[5] Known as the spring floor mouse and rat trap. Manufactured by the Bromwell Wire Goods Co., Michigan City, Ind.

6½" x 4½" and is equipped with a trap door which is released by the weight of the rat on the floor. To make the transfer this metal trap is placed in the open position opposite the door of the rabbit trap. When the latter is opened the rat runs into the metal trap and is caught. Their square shape and the ease with which they can be stacked together make these traps very useful in transporting large numbers of rats. These traps can also be used in the laboratory to transfer wild rats from one cage to another.

About 2,000 of the wooden box traps have been constructed and used in various parts of Baltimore. After having been in service from 6 months to 2 years nearly all are in good working condition. Because of the high efficiency of this trap it has been possible not only to obtain thousands of live specimens in good condition for laboratory experimentation but also to obtain fairly complete data on the rat populations of the 89 city blocks for census and analysis purposes. The traps have been used also in control work to catch rats which survive poisoning operations, and in special locations where poisoning is not advisable.

SUMMARY

A simple and inexpensive modified rabbit box trap has been described which has a high efficiency for catching wild rats. It requires little servicing or upkeep.

A collection box and a small metal box trap were described for use in transferring rats from the rabbit traps to cages in the laboratory.

A REPORT OF DAMAGE TO FABRIC BY LIQUID HYDROCYANIC ACID GAS IN FUMIGATION[1]

By G. C. SHERRARD, *Senior Surgeon (R), United States Public Health Service*

Recently, during fumigation of Coast Guard barracks at Baltimore, Md., a discoid of liquid hydrocyanic acid gas was thrown inadvertently on top of a Coast Guard hat band made of rayon material, which was lying on a mattress. When the liquid hydrocyanic acid gas in the discoid came in contact with the band, a gummy mass was formed. The individual rayon fibers appeared to have been softened and to have merged with each other, losing their identity. This effect probably was caused by the solvent action of the gas on the fibers. As seen in the accompanying photograph, the part of the fabric which did not come in direct contact with the discoid remained uninjured.

In order to determine whether or not an exceedingly high atmospheric concentration of hydrocyanic acid gas would cause damage to the uninjured portion, the band was exposed to an atmospheric concentration of 66.6 ounces of the gas per 1,000 cubic feet of space for a period of 4 hours. The test was performed in an airtight steel fumi-

[1] From the Foreign Quarantine Division.

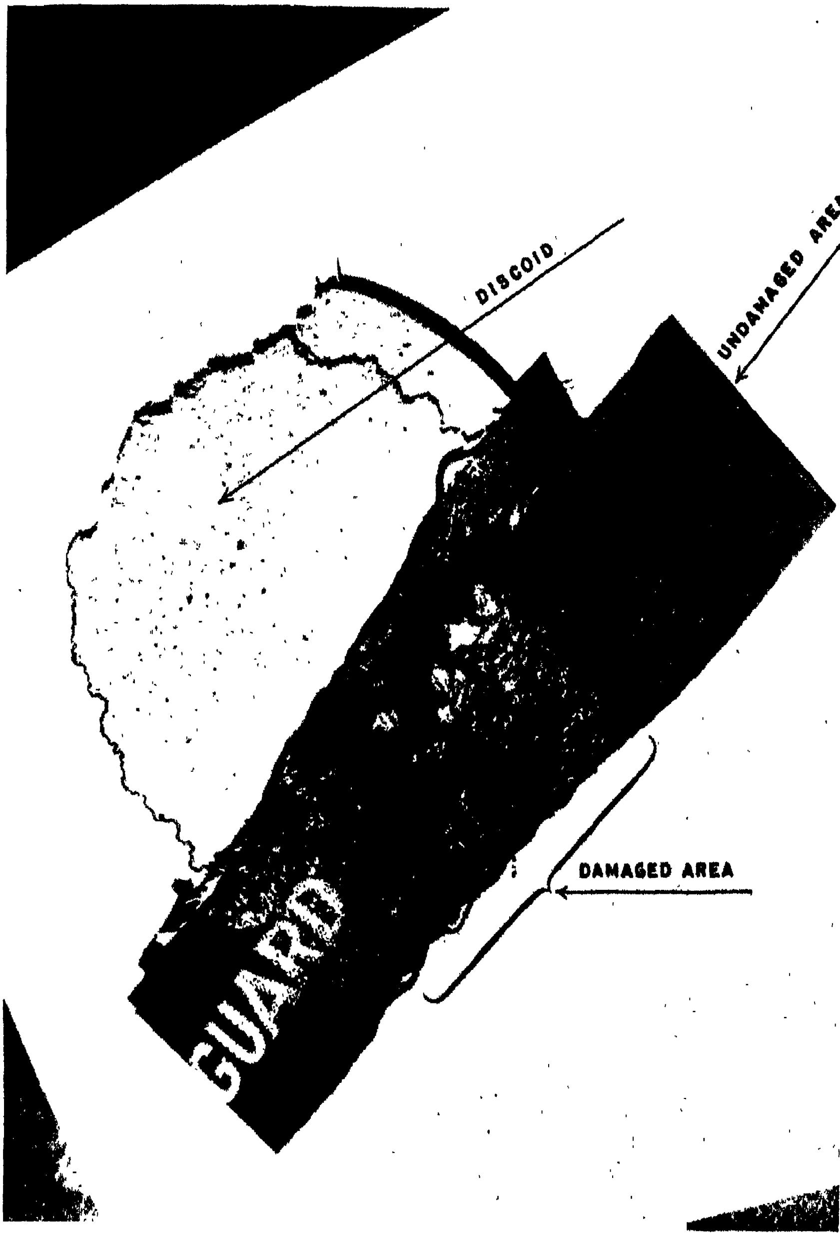

FIGURE 1.—Photograph showing hydrocyanic acid gas discoid adhered to rayon hat band. Edge of discoid has been crumpled in handling.

gating chamber, at a temperature of 50° F., and a +90-percent relative humidity. The uninjured portion of the band then was inspected carefully for evidence of injury. No such injury could be demonstrated. In color, texture, strength, and pliability of the fabric, the exposed specimen could not be distinguished from a new band.

Tests performed by the author several years ago at the New York Quarantine Station showed that hydrocyanic acid gas discoids damaged linoleum through two layers of heavy brown paper, but that four layers gave protection.

Experienced fumigators are aware that floor coverings and highly finished floors are subject to what they term "burns," when placed in contact with absorbent discoids containing liquid hydrocyanic acid gas. For this reason, they protect such coverings and floors by several layers of paper or other protective materials placed at points suitable for the distribution of the discoids.

In ship fumigation, experience has shown that hydrocyanic acid in gaseous form will not injure fabrics when the atmospheric concentration is not greater than 6 ounces per 1,000 cubic feet of space. However, the direct contact of discoids containing this gas in liquid form is capable of causing damage. It is probable that this damage is caused by the solvent action of the liquid on the fiber or dye. Fabrics composed of fibers of animal or vegetable origin appear to be less susceptible to damage than those of synthetic origin. Fabrics with a nap or pile, such as blankets and carpets, are not so likely to be damaged by direct contact with hydrocyanic acid gas discoids, because the nap or pile permits enough circulation of air beneath the discoids to allow evaporation of the liquid hydrocyanic acid gas before it comes in contact with the body of the fabric. In higher concentrations, fragile fabrics, such as window curtains, have been observed to undergo a slight change of color, white fabrics assuming a slight orange tinge. Linen fabrics appear more susceptible to color change than fabrics composed of cotton or animal fibers.

The practice of distributing discoids directly on carpets, even though they are composed of animal fiber and have a deep pile, may result in spotting or discoloration of the area immediately beneath the discoid. Damage of this type has been observed in ship fumigation. Careful inspection indicated that the damage was caused either by a solvent action of the liquid acid on the fabric dye or by a chemical reaction between the dye and the acid, with no apparent damage to the fiber.

Since hydrocyanic acid gas is slightly lighter than air and has a tendency to rise during the process of diffusion, it is good fumigating practice to distribute the discoids over the floor of the compartment to be fumigated. Therefore, it is a simple matter to protect finished floors or coverings by suitable layers of paper or canvas.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

September 9–October 6, 1945

The accompanying table (table 1) summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended October 6, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

TABLE 1.—*Number of reported cases of 9 communicable diseases in the United States during the 4-week period September 9–October 6, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44*

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	Current median
	Diphtheria			Influenza [1]			Measles [2]		
United States	1,959	1,387	1,440	3,906	3,227	3,358	2,450	1,657	2,816
New England	30	17	25	50	16	9	229	170	304
Middle Atlantic	77	74	74	19	12	26	325	213	622
East North Central	170	119	138	112	79	204	455	284	519
West North Central	99	100	110	18	22	34	69	67	177
South Atlantic	643	310	485	1,085	968	968	80	124	151
East South Central	419	278	264	100	71	119	55	27	54
West South Central	328	287	287	2,310	1,828	1,642	146	127	124
Mountain	67	72	67	169	179	298	336	80	213
Pacific	126	130	91	43	52	101	755	565	359
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	359	519	192	3,242	4,452	2,859	5,035	4,810	4,810
New England	11	35	20	262	199	151	306	386	386
Middle Atlantic	78	112	52	905	2,030	304	772	663	796
East North Central	72	120	19	699	906	811	1,087	1,169	1,208
West North Central	41	43	10	343	313	313	447	478	519
South Atlantic	46	50	41	258	528	314	919	770	770
East South Central	28	28	11	112	195	78	370	385	426
West South Central	36	31	9	216	55	55	389	195	181
Mountain	3	17	5	172	59	59	179	201	172
Pacific	44	83	29	275	167	125	566	563	375
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	11	10	19	646	605	813	8,184	6,808	10,726
New England	0	0	0	23	34	34	933	620	886
Middle Atlantic	0	0	0	71	80	110	2,525	1,277	2,732
East North Central	1	7	7	75	62	109	1,720	1,632	3,009
West North Central	3	0	3	26	51	51	262	409	544
South Atlantic	1	2	1	113	118	150	969	1,108	1,160
East South Central	2	1	2	161	87	107	303	295	413
West South Central	3	0	3	109	110	152	563	655	535
Mountain	0	0	1	41	28	51	299	358	478
Pacific	1	0	1	27	35	35	610	454	917

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

DISEASES ABOVE MEDIAN PREVALENCE

Poliomyelitis.—The number of cases of poliomyelitis dropped from 3,436 during the preceding 4 weeks to 3,242 during the 4 weeks ended October 6. The number was about 70 percent of the 1944 incidence for this period, but it was 10 percent above the 1940–44 median. The number of cases was higher than in 1944 in the New England, West North Central, West South Central, Mountain, and Pacific sections and lower in the Middle Atlantic, East North Central, South Atlantic, and East South Central sections. Compared with preceding years the current incidence was higher than the median expectancy in all sections except the East North Central and South Atlantic sections. Sixty-five percent of the total cases were reported from 10 States, viz, New York (446 cases), Illinois (290), Pennsylvania (236), New Jersey (223), California (195), Wisconsin (187), Massachusetts (179), Texas (139), Ohio (131), and Iowa (107).

Table 2 shows the total reported cases since the beginning of the year and the incidence by weeks since the first of August, with corresponding data for 1944 and 1943. Early reports indicated that the peak of the current epidemic might have been reached during the week ended August 25, and in some sections the largest number of cases was reported during that week. However, later reports show that the highest weekly incidence for the country as a whole was reached during the week ended September 15, when 965 cases were reported. While there has been considerable fluctuation in the number of weekly cases in the various sections of the country the incidence had definitely declined in all sections.

Diphtheria.—For the current 4-week period there were 1,959 cases of diphtheria reported as compared with 1,387 for the corresponding period in 1944 and a 5-year (1940–44) median of 1,440 cases. For the country as a whole the incidence was the highest for this period since 1939 when approximately 2,300 cases were reported. The incidence was considerably above the normal seasonal expectancy in the East North Central, South Atlantic, East and West South Central, and Pacific sections, but in the other 4 sections the numbers of cases were either about the same as the median or fell below it. The disease is most prevalent in the South Atlantic and South Central sections, the largest excess over the median being reported from the East South Central section.

Influenza.—The number of cases of influenza reported for the current 4-week period was about 20 percent above the median expectancy. The increase, however, was confined to only three sections of the country, viz, the West South Central, South Atlantic, and New England sections—of the total cases 2,133 occurred in the State of Texas. In all other sections the incidence was relatively low.

TABLE 2.—*Number of cases of poliomyelitis reported in each geographic area during 1945, 1944, and 1943* [1]

Division	Total Jan. 1–Oct. 13	Week ended—										
		August				September					October	
		4	11	18	25	1	8	15	22	20	6	13
All regions:												
1945	10,808	476	671	692	931	917	896	965	864	774	639	549
1944	16,179	932	1,015	1,260	1,529	1,680	1,498	1,440	1,159	976	877	710
1943	10,319	450	545	747	872	956	906	1,020	818	679	515	495
New England:												
1945	734	33	53	38	62	63	59	69	78	59	56	44
1944	634	36	37	54	74	75	64	49	71	38	41	38
1943	734	32	36	62	62	77	73	91	85	84	28	52
Middle Atlantic:												
1945	3,123	196	227	232	344	295	236	330	213	207	155	127
1944	7,037	413	449	601	756	895	761	674	505	470	381	320
1943	769	20	38	46	57	72	73	91	83	67	.63	50
East North Central:												
1945	1,888	51	113	121	189	177	222	160	201	190	148	136
1944	2,762	143	178	215	271	321	255	329	236	174	167	142
1943	2,048	46	79	144	241	249	273	288	207	171	145	101
West North Central:												
1945	807	15	29	33	49	97	88	122	69	82	70	69
1944	928	28	54	67	104	77	112	76	85	73	79	64
1943	1,372	61	117	118	131	183	138	148	114	88	80	67
South Atlantic:												
1945	1,098	46	78	76	86	80	70	60	82	59	57	31
1944	2,541	167	167	195	214	205	187	169	149	114	96	88
1943	203	5	8	7	10	8	10	23	14	18	9	9
East South Central:												
1945	610	28	35	47	37	30	39	23	33	27	29	28
1944	1,013	84	67	53	56	48	57	59	53	43	40	20
1943	209	11	5	29	20	14	12	7	6	10	4	6
West South Central:												
1945	1,221	58	78	79	86	60	52	75	66	46	29	37
1944	423	27	23	16	11	14	17	15	13	14	13	7
1943	1,782	122	119	104	117	81	90	89	67	49	23	38
Mountain:												
1945	481	18	29	17	35	55	59	54	46	34	38	29
1944	181	4	9	12	16	12	15	18	21	12	8	5
1943	774	29	23	43	47	123	93	92	85	46	51	36
Pacific:												
1945	846	31	29	49	43	60	70	72	76	70	57	48
1944	660	30	31	47	27	33	30	51	26	38	522	26
1943	2,428	124	120	194	187	149	144	191	157	146	112	136

[1] Similar tables with earlier data appeared in PUBLIC HEALTH REPORTS of Sept. 7, 1945, page 1055, and Oct. 5, 1945, p. 1183.

Meningococcus meningitis.—The number of cases of meningococcus meningitis rose from 299 for the preceding 4 weeks to 359 for the 4 weeks ended October 6. The number was about 70 percent of the 1944 figure (519 cases) for this period, but it was almost twice the 1940–44 median. The West South Central section alone reported an increase over the 1944 incidence, but all sections except the New England and Mountain reported increases over the 1940–44 medians. Reports indicate that the increase that normally occurs in the early fall may have appeared somewhat earlier than usual this year, since in many preceding years the lowest incidence of the year was reported during the period corresponding to the one under consideration.

Scarlet fever.—The number of cases of scarlet fever rose from 3,356 during the preceding 4 weeks to 5,035 during the 4 weeks ended October 6. An increase of this disease is normally expected at this

season of the year. While the number of cases was slightly above the 1940–44 median, the rate of increase during the current period was considerably below that of the corresponding period in preceding years. In the South Atlantic, West South Central, and Pacific sections the incidence was higher than the seasonal expectancy, in the Mountain section the number of cases was about normal, and in all other sections the incidence was relatively low.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—For the 4 weeks ended October 6 there were 2,450 cases of measles reported as compared with 1,657 for the corresponding period in 1944 and a 5-year (1940–44) median of 2,816 cases. The incidence was above the normal expectancy in the West South Central, Mountain, and Pacific sections and about normal in the East South Central section, but all other sections reported a relatively low incidence.

Smallpox.—The incidence of smallpox for the current 4 weeks was about on a level with the incidence for the corresponding period in 1944, but the number of cases (11) was about 60 percent of the 1940–44 median (19 cases). In regions where cases occurred the number was either the same or less than the median.

Typhoid and paratyphoid fever.—The number of cases (646) of this disease was slightly higher than the number reported for the corresponding 4 weeks in 1944, but it was only about 80 percent of the seasonal expectancy (813 cases). The East North Central, East South Central, and Mountain sections reported more cases than occurred during the corresponding period in 1944, but the East South Central section alone reported an excess over the preceding 5-year median.

Whooping cough.—The number of cases (8,184) of whooping cough was 1.2 times the number reported for the same 4 weeks in 1944, but it was only about 75 percent of the 1940–44 median (approximately 11,000 cases). The New England, Middle Atlantic, East North Central, East South Central, and Pacific sections reported a higher incidence than occurred in 1944, but only 2 sections, the New England and West South Central, reported an excess over the 1940–44 median.

MORTALITY, ALL CAUSES

For the 4 weeks ended October 6 there were 33,136 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding period in 1942–44 was 31,372 deaths. For each of the first 3 weeks of the period the number of deaths was higher than the preceding 3-year average, but during the last week the number was 2.3 percent less than the average.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 13, 1945

Summary

For the fourth consecutive week the incidence of poliomyelitis declined. A total of 549 cases was reported, as compared with 639 last week, 711 for the corresponding week last year, and a 5-year (1940–44) median of 484. An increase was recorded only in the West South Central area (from 29 to 37 cases). Six of the 15 States reporting 10 or more cases (Michigan, Wisconsin, Iowa, Tennessee, Oklahoma, and Washington) reported an aggregate of 144 cases, an increase for the week of 42, while in 8 of these 15 States (Massachusetts, New York, New Jersey, Pennsylvania, Ohio, Illinois, Minnesota, and California) a decline of 77 cases occurred—from 346 to 269. Texas reported the same number (20) for both weeks. The total to date is 10,845, as compared with 16,134 and 10,319, respectively, for the corresponding periods of 1944 and 1943, and a 5-year median of 7,435.

Of the total of 75 cases of meningococcus meningitis reported, as compared with 89 last week and a 5-year median of 49, New York reported 8, California 6, and Ohio and Pennsylvania 5 each. The cumulative total is 6,843, as compared with 14,154 and 14,954, respectively, for the corresponding periods of the epidemic years 1944 and 1943, and a 5-year median of 2,782.

Of the current total of 592 cases of diphtheria reported, more than for the corresponding week of any of the last 5 years except 1942 (613), 362 cases, or 61 percent, occurred in the South Atlantic and East South Central areas, as compared with 177 cases, or 41 percent, of the total for the corresponding week last year. The total to date is 11,855, as compared with 9,268 for the corresponding period last year and a 5-year median of 10,537.

A total of 8,380 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,316 last week, 8,390 for the corresponding week last year, and a 3-year (1942–44) average of 8,509. The cumulative total is 366,622, as compared with 368,199 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended October 13, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44	Week ended—		Median 1940-44
	Oct. 13, 1945	Oct. 14, 1944		Oct. 13, 1945	Oct. 14, 1944		Oct. 13, 1945	Oct. 14, 1944		Oct. 13, 1945	Oct. 14, 1944	
NEW ENGLAND												
Maine	1	0	0	1	------	------	4	1	24	0	2	1
New Hampshire	0	0	0	------	------	------	0	0	1	0	0	0
Vermont	3	0	0	------	7	------	0	1	5	0	0	0
Massachusetts	0	4	3	------	------	------	67	40	74	2	5	3
Rhode Island	0	0	0	20	9	------	2	0	4	0	3	2
Connecticut	0	1	1	------	7	6	5	6	6	1	2	1
MIDDLE ATLANTIC												
New York	5	11	12	------	[1] 2	[1] 5	16	25	76	8	10	5
New Jersey	4	1	2	4	1	5	14	13	24	4	9	3
Pennsylvania	6	8	12	1	2	1	100	20	67	5	12	8
EAST NORTH CENTRAL												
Ohio	10	0	12	------	2	6	11	8	19	5	9	2
Indiana	13	5	8	2	3	5	3	5	9	3	1	1
Illinois	7	8	14	1	------	7	50	10	19	4	10	7
Michigan [2]	12	14	12	1	------	1	60	7	57	2	12	2
Wisconsin	2	0	3	21	9	10	15	43	53	2	2	1
WEST NORTH CENTRAL												
Minnesota	5	19	5	------	2	2	6	2	4	1	5	0
Iowa	8	1	2	3	------	------	2	2	8	0	4	0
Missouri	5	4	6	2	------	1	3	1	5	3	7	0
North Dakota	0	3	2	3	------	4	0	0	4	0	2	0
South Dakota	2	4	4	------	------	------	2	1	2	0	0	0
Nebraska	7	13	2	------	4	2	4	2	8	1	0	0
Kansas	5	2	2	2	------	2	13	13	6	0	1	1
SOUTH ATLANTIC												
Delaware	1	0	0	------	------	------	1	0	1	0	0	0
Maryland [2]	20	0	6	------	4	3	1	2	5	2	2	2
District of Columbia	0	0	0	------	------	------	0	0	1	0	1	1
Virginia	30	10	30	110	123	123	20	2	22	2	4	2
West Virginia	30	7	7	------	2	2	0	0	5	0	4	1
North Carolina	84	30	50	------	5	1	3	7	7	2	2	1
South Carolina	30	13	25	302	218	200	49	2	4	0	1	1
Georgia	33	22	28	18	12	13	3	5	5	1	2	1
Florida	7	0	6	8	1	1	0	4	1	0	2	1
EAST SOUTH CENTRAL												
Kentucky	28	6	13	------	------	------	23	2	7	1	0	2
Tennessee	20	13	13	38	4	8	1	0	11	3	3	1
Alabama	23	37	32	18	17	17	1	2	3	2	1	1
Mississippi [2]	44	27	17	------	------	------	0	------	------	1	1	0
WEST SOUTH CENTRAL												
Arkansas	12	10	16	28	32	16	4	1	5	2	0	0
Louisiana	8	25	14	4	1	3	1	1	1	1	1	1
Oklahoma	5	12	12	9	23	25	1	0	3	2	1	0
Texas	60	40	43	712	947	507	25	44	25	2	4	2
MOUNTAIN												
Montana	1	0	2	------	2	8	15	2	11	1	1	0
Idaho	0	0	0	7	3	3	57	1	1	0	0	0
Wyoming	2	1	1	1	2	2	1	1	1	0	0	0
Colorado	9	3	3	33	10	21	5	12	12	0	1	0
New Mexico	4	11	0	3	------	------	2	0	0	0	0	0
Arizona	1	2	1	20	20	47	1	0	13	0	0	0
Utah [2]	0	0	0	------	------	1	8	5	5	0	0	0
Nevada	0	0	0	------	------	------	1	1	0	0	0	0
PACIFIC												
Washington	12	8	1	------	------	------	80	8	9	4	4	1
Oregon	9	2	2	------	7	7	0	21	11	2	3	1
California	17	26	24	7	11	28	157	180	57	6	13	2
Total	592	430	433	1,388	1,191	1,191	837	521	980	75	156	49
41 weeks	11,855	9,208	10,537	78,593	344,741	173,317	106,311	594,801	540,201	6,843	14,154	2,782

[1] New York City only.
[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended October 13, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended— Oct. 13, 1945	Week ended— Oct. 14, 1944	Median 1940–44	Week ended— Oct. 13, 1945	Week ended— Oct. 14, 1944	Median 1940–44	Week ended— Oct. 13, 1945	Week ended— Oct. 14, 1944	Median 1940–44	Week ended— Oct. 13, 1945	Week ended— Oct. 14, 1944	Median 1940–44
NEW ENGLAND												
Maine	5	0	0	19	14	10	0	0	0	2	1	2
New Hampshire	1	2	1	7	1	2	0	0	0	0	0	0
Vermont	1	2	1	2	4	6	0	0	0	1	0	0
Massachusetts	28	27	13	66	87	92	0	0	0	3	3	3
Rhode Island	0	1	1	4	7	4	0	0	0	0	0	0
Connecticut	9	7	5	5	24	18	0	0	0	1	7	0
MIDDLE ATLANTIC												
New York	68	284	35	108	126	126	0	0	0	13	5	12
New Jersey	32	26	14	14	25	38	0	0	0	3	4	4
Pennsylvania	27	60	18	117	118	110	0	0	0	7	8	8
EAST NORTH CENTRAL												
Ohio	20	60	21	111	129	129	0	1	0	5	3	7
Indiana	3	11	5	49	32	33	0	0	0	2	7	4
Illinois	48	36	36	104	70	120	0	0	0	4	1	8
Michigan [2]	16	22	24	71	77	75	0	0	0	5	2	4
Wisconsin	49	18	12	61	34	89	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota	16	25	19	30	37	49	0	0	0	0	0	0
Iowa	34	14	14	44	29	33	0	0	0	0	1	1
Missouri	6	17	4	31	14	32	0	0	0	2	0	3
North Dakota	1	2	1	3	8	8	0	0	0	0	0	0
South Dakota	0	2	1	4	6	13	0	0	0	0	1	0
Nebraska	7	1	6	11	33	24	0	0	0	0	0	0
Kansas	5	3	11	36	57	62	0	0	0	0	0	1
SOUTH ATLANTIC												
Delaware	0	6	2	3	0	4	0	0	0	2	0	0
Maryland [2]	1	16	2	14	43	26	0	0	0	2	1	5
District of Columbia	6	13	0	9	4	11	0	0	0	0	0	0
Virginia	6	21	11	79	42	39	0	0	0	10	3	9
West Virginia	2	14	5	114	51	42	0	0	0	2	2	5
North Carolina	5	10	2	82	62	113	0	0	0	0	4	5
South Carolina	6	0	0	8	4	13	0	0	0	2	0	2
Georgia	0	5	1	19	8	40	0	0	0	2	12	11
Florida	5	3	1	7	8	8	0	0	0	5	4	1
EAST SOUTH CENTRAL												
Kentucky	2	12	6	62	34	55	0	0	0	7	3	5
Tennessee	19	7	5	36	51	53	0	0	0	3	2	6
Alabama	1	0	3	13	16	21	0	0	0	2	1	3
Mississippi [2]	6	1	1	10	10	12	0	0	0	1	2	2
WEST SOUTH CENTRAL												
Arkansas	5	3	1	20	5	13	0	0	0	9	3	6
Louisiana	0	0	3	10	7	8	0	0	0	2	4	7
Oklahoma	12	0	2	20	13	17	0	0	0	2	0	5
Texas	20	4	5	57	35	32	0	0	0	10	5	9
MOUNTAIN												
Montana	7	0	0	18	10	10	0	0	0	2	1	0
Idaho	3	1	0	5	12	12	0	0	0	1	0	0
Wyoming	7	0	0	8	10	4	0	1	0	0	0	1
Colorado	2	3	1	29	20	18	0	1	0	1	1	1
New Mexico	0	1	0	8	3	3	0	0	0	0	1	2
Arizona	3	0	0	13	2	3	0	0	0	1	1	1
Utah [2]	7	0	2	13	8	8	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	14	8	8	26	38	28	0	0	0	0	0	2
Oregon	4	3	5	19	28	7	0	0	0	2	1	1
California	30	10	10	138	114	89	0	0	0	5	7	6
Total	549	711	484	1,736	1,565	1,654	0	3	9	121	101	176
41 weeks	10,845	16,134	7,435	143,945	156,063	108,609	286	324	658	[4] 4,063	4,575	5,689

[2] Period ended earlier than Saturday.
[3] Including paratyphoid fever reported separately, as follows: Massachusetts 2; New York 2; Ohio 2; South Carolina 1; Georgia 1; Oklahoma 2; Texas 2; California 2.
[4] Corrected cumulative total.

Telegraphic morbidity reports from State health officers for the week ended October 13, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Whooping cough: Week ended— Oct. 13, 1945	Whooping cough: Week ended— Oct. 14, 1944	Whooping cough: Median 1940–44	Week ended Oct. 13, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	12	10	8	0	0	0	0	0	0	0	3
New Hampshire	2	0	0	0	0	0	0	0	0	0	0
Vermont	14	10	10	0	0	0	0	0	0	0	0
Massachusetts	108	45	99	0	2	0	2	0	0	0	0
Rhode Island	6	15	19	0	0	0	0	0	0	0	0
Connecticut	22	12	37	0	1	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	209	130	281	4	32	0	2	0	0	0	8
New Jersey	101	44	80	1	0	0	0	0	0	2	5
Pennsylvania	132	108	239	0	0	0	1	0	0	0	2
EAST NORTH CENTRAL											
Ohio	97	90	159	0	2	1	0	0	0	0	2
Indiana	17	13	12	0	0	4	1	0	0	0	1
Illinois	60	47	150	4	10	0	1	0	0	0	3
Michigan [3]	101	69	210	0	5	0	0	0	0	0	2
Wisconsin	62	66	137	1	0	0	0	0	0	0	3
WEST NORTH CENTRAL											
Minnesota	19	20	41	1	0	0	0	0	0	0	1
Iowa	3	1	11	0	0	0	0	0	0	0	0
Missouri	13	12	16	0	0	0	0	0	2	0	2
North Dakota	0	6	13	0	0	0	0	0	0	0	2
South Dakota	0	6	6	0	0	0	0	0	0	0	0
Nebraska	0	0	5	0	0	0	0	0	0	0	0
Kansas	26	22	29	0	0	0	0	0	0	0	15
SOUTH ATLANTIC											
Delaware	1	0	2	0	0	0	0	0	0	0	0
Maryland [3]	20	73	51	0	0	2	0	0	0	0	0
District of Columbia	7	4	4	0	0	0	0	0	0	0	0
Virginia	10	14	29	3	0	228	0	1	1	0	0
West Virginia	25	7	11	0	0	0	0	0	0	0	0
North Carolina	58	80	69	1	0	0	0	0	0	3	0
South Carolina	74	37	25	5	50	0	0	0	0	9	0
Georgia	31	100	14	1	1	0	0	0	1	42	0
Florida	1	4	5	2	0	0	0	0	0	8	0
EAST SOUTH CENTRAL											
Kentucky	32	6	37	0	0	0	0	0	0	0	0
Tennessee	14	12	34	1	0	3	0	0	1	4	2
Alabama	7	8	8	0	0	0	1	0	0	9	2
Mississippi [3]	------	------	------	0	0	0	0	0	2	13	5
WEST SOUTH CENTRAL											
Arkansas	1	37	20	10	24	0	0	0	5	2	1
Louisiana	2	0	1	1	1	0	0	0	0	30	2
Oklahoma	2	13	4	1	3	0	0	1	0	0	2
Texas	80	90	96	7	300	17	0	0	1	38	8
MOUNTAIN											
Montana	6	17	17	0	0	0	0	0	0	0	0
Idaho	1	0	0	0	0	1	0	0	0	0	0
Wyoming	1	2	4	0	0	1	0	0	0	0	0
Colorado	21	9	19	0	0	0	0	0	0	0	0
New Mexico	0	3	5	0	4	1	0	0	0	0	1
Arizona	7	8	3	0	1	4	0	0	0	0	0
Utah [3]	9	5	16	0	0	0	0	0	1	0	0
Nevada	0	2	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	10	17	17	0	0	0	0	0	0	0	2
Oregon	4	7	12	0	0	0	0	0	0	0	0
California	126	67	175	4	2	0	2	0	0	9	3
Total	1,566	1,373	2,000	56	438	262	10	2	14	164	78
Same week, 1944	1,378	------	------	61	599	229	18	2	9	137	64
Average, 1942–44	2,116	------	------	47	465	153	12	[5] 2	9	[5] 104	------
41 weeks: 1945	100,756	------	------	1,519	20,083	9,289	521	445	617	3,952	3,780
1944	76,482	------	------	1,429	18,201	7,273	543	430	459	4,044	3,213
Average, 1942–44	124,385	------	[5] 144,350	1,368	14,016	6,490	528	[5] 439	624	[5] 2,779	------

[3] Period ended earlier than Saturday.
[5] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 6, 1945

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	0	2	1	0	0	4
New Hampshire:												
Concord	0	0	------	0	1	0	0	0	4	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	3	0	------	0	3	0	12	27	18	0	0	28
Fall River	0	0	------	0	1	0	0	0	4	0	0	0
Springfield	3	0	------	0	3	0	0	0	2	0	0	2
Worcester	0	0	------	0	23	0	4	0	3	0	0	7
Rhode Island:												
Providence	0	0	------	0	0	0	1	0	2	0	0	7
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	0	0	0	0	0
Hartford	0	0	------	0	0	0	0	0	1	0	0	2
New Haven	0	0	------	0	0	0	0	0	1	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	1	4	3	7	0	0	17
New York	2	2	5	0	12	3	45	27	27	0	5	90
Rochester	0	0	------	0	1	1	0	3	4	0	0	7
Syracuse	0	0	------	0	0	0	4	0	7	0	0	13
New Jersey:												
Camden	1	0	------	0	1	0	0	0	1	0	0	4
Newark	0	0	------	0	4	1	3	3	0	0	0	20
Trenton	0	0	2	0	0	0	1	1	0	0	0	3
Pennsylvania:												
Philadelphia	1	0	1	0	10	1	15	9	22	0	1	74
Pittsburgh	3	0	1	1	0	0	5	4	5	0	0	12
Reading	0	0	------	0	1	0	0	0	0	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	0	0	------	1	0	1	8	2	4	0	0	5
Cleveland	1	0	3	0	3	1	6	6	13	0	0	29
Columbus	2	0	------	0	0	0	1	0	10	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	0	0	2	0	0	0	0	0
Indianapolis	3	0	------	0	0	1	1	0	13	0	0	4
South Bend	0	0	------	0	0	0	0	0	2	0	0	0
Terre Haute	0	0	------	0	0	0	2	0	0	0	0	0
Illinois:												
Chicago	1	0	1	0	35	10	20	16	18	0	0	40
Springfield	0	0	------	0	0	0	1	0	1	0	0	4
Michigan:												
Detroit	7	0	------	0	24	4	6	1	17	0	3	61
Flint	0	0	------	0	6	0	3	0	3	0	0	4
Grand Rapids	0	0	------	0	3	0	1	0	4	0	0	1
Wisconsin:												
Kenosha	0	0	------	0	1	0	0	0	1	0	0	0
Milwaukee	0	0	1	1	3	2	4	18	4	0	0	3
Racine	0	0	------	0	1	0	0	0	0	0	0	2
Superior	0	0	------	0	0	0	0	0	1	0	0	6
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	0	2	1	0	0	0
Minneapolis	1	0	------	1	2	1	4	8	3	0	0	6
Missouri:												
Kansas City	2	0	------	0	1	0	4	0	3	0	0	2
St. Joseph	0	0	------	0	0	0	0	0	2	0	0	0
St. Louis	1	1	1	1	1	1	5	11	2	0	0	6

City reports for week ended October 6, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	1	0	0	9	1	0	0	0
Kansas:												
Topeka	0	0	------	0	1	0	0	0	3	0	0	0
Wichita	1	0	------	0	0	0	4	0	5	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	2	1	0	0	1	2
Maryland:												
Baltimore	4	0	------	0	1	0	9	2	11	0	0	28
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	2	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	1	0	5	6	10	0	1	15
Virginia:												
Lynchburg	0	0	------	0	0	0	1	0	2	0	0	2
Richmond	1	0	------	0	0	0	1	8	11	0	0	0
Roanoke	1	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	0	1	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	0	0	0	0
Wilmington	1	0	------	0	0	0	0	0	2	0	0	3
Winston-Salem	0	0	------	1	0	1	3	0	3	0	0	1
South Carolina:												
Charleston	1	0	15	0	0	0	0	1	0	0	1	0
Georgia:												
Atlanta	0	0	2	0	0	1	4	0	1	0	0	0
Brunswick	0	0	------	0	0	0	1	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	1	0	0	0
Florida:												
Tampa	0	0	------	0	0	0	1	1	0	0	2	[illegible]
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	------	0	0	0	2	0	4	0	1	6
Nashville	0	0	------	0	1	0	0	3	0	0	0	3
Alabama:												
Birmingham	1	0	------	0	0	0	1	0	5	0	0	0
Mobile	1	0	4	0	0	0	2	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	1	0	1	0	2	0	1	0
Louisiana:												
New Orleans	7	0	2	1	1	0	8	1	2	0	1	0
Shreveport	2	0	------	0	0	0	3	4	0	0	1	0
Texas:												
Dallas	4	0	------	0	0	0	2	0	7	0	0	0
Galveston	0	0	------	0	0	0	1	0	0	0	0	0
Houston	3	0	------	0	0	3	2	2	4	0	2	0
San Antonio	1	0	------	0	0	0	5	0	1	0	0	3
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	8	0	0	0	0
Great Falls	0	0	------	0	2	0	0	0	0	0	1	3
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	0	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	6	0	3	1	3	0	6	2	5	0	0	6
Pueblo	0	0	------	0	0	0	2	0	1	0	0	2
Utah:												
Salt Lake City	0	0	------	0	3	0	1	8	0	0	0	1

City reports for week ended October 6, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	11	1	4	1	1	0	1	2
Spokane	0	0	1	0	0	0	4	0	1	0	0	1
Tacoma	1	0	------	0	9	0	0	1	0	0	0	0
California:												
Los Angeles	2	0	6	0	5	0	2	9	22	0	0	10
Sacramento	0	1	------	0	3	0	4	0	0	0	0	0
San Francisco	0	0	------	0	26	6	5	3	11	0	0	8
Total	69	4	48	8	209	40	252	213	327	0	22	569
Corresponding week, 1944	75	------	35	10	86	------	244	------	340	0	23	417
Average, 1940–44	70	------	47	[1] 14	[2] 197	------	[1] 278	------	407	0	30	868

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York 1; Chicago 2; Baltimore 1; Los Angeles, 1.

Dysentery, bacillary.—Cases: New Haven 2; New York 17; Syracuse 1; Columbus 1; Detroit 1; Wilmington, Del., 1; Baltimore 1; Charleston, S. C., 14.

Dysentery, unspecified.—Cases: Baltimore 2; Richmond 1; San Antonio 4.

Rocky Mountain spotted fever.—Cases: Birmingham 1.

Typhus fever, endemic.—Cases: New York 1; Wilmington, N. C., 3; Charleston, S. C., 1; Atlanta 2; Savannah 7; Tampa 2; Birmingham 5; Mobile 3; Little Rock 1; New Orleans 16 (monthly reports from Charity Hospital); Dallas 1; Houston 1; San Antonio 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 34,010,100)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	15.7	0.0	0.0	0.0	81	0.0	44.4	75.8	94	0.0	0.0	130
Middle Atlantic	3.2	0.9	4.2	0.5	13	3.2	35.6	23.1	34	0.0	2.8	112
East North Central	8.5	0.0	3.0	1.2	40	11.6	33.4	26.1	55	0.0	1.8	99
West North Central	13.5	2.3	2.3	4.5	14	4.5	38.3	67.6	45	0.0	0.0	34
South Atlantic	13.4	0.0	28.5	1.7	3	3.3	50.2	81.8	69	0.0	8.4	85
East South Central	11.8	0.0	23.6	0.0	6	0.0	29.5	17.7	53	0.0	5.9	53
West South Central	48.8	0.0	5.7	2.9	6	8.6	63.1	20.1	46	0.0	14.3	9
Mountain	47.7	0.0	23.8	7.9	64	0.0	79.4	143.0	48	0.0	7.9	95
Pacific	4.7	1.6	11.1	0.0	85	11.1	30.0	22.1	55	0.0	1.6	33
Total	10.6	0.6	7.4	1.2	32	6.1	38.7	32.7	50	0.0	3.4	87

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 22, 1945.—During the week ended September 22, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		2		17	43	11	22	30	30	155
Diphtheria		3	6	22	9	9				49
Dysentery, bacillary				10						10
Encephalitis, infectious						1				1
German measles					4			2	3	9
Influenza		13			8		3		6	30
Measles		1	1	10	65	2		15	22	125
Meningitis, meningococcus	1				2					3
Mumps		3			20	6	3	18	15	65
Poliomyelitis			2	7	[1] 8			2	2	[1] 21
Scarlet fever	1	4	11	61	36	13	5	25	17	173
Tuberculosis (all forms)		6	2	146	47	5		15	45	266
Typhoid and paratyphoid fever			1	37	3		1	2	2	46
Undulant fever				2	1					3
Venereal diseases:										
Gonorrhea	3	28	14	148	245	54	47	56	134	729
Syphilis	1	12	7	153	110	10	12	13	29	347
Whooping cough		2	2	140	83	5		20	3	214

[1] Includes 2 cases, delayed reports.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

British East Africa—Kenya.—For the week ended September 8, 1945, 11 cases of plague with 4 deaths were reported in Kenya, British East Africa.

Smallpox

Belgian Congo.—For the week ended September 22, 1945, 94 cases of smallpox were reported in Belgian Congo.

British East Africa—Tanganyika.—For the week ended September 8, 1945, 204 cases of smallpox with 48 deaths were reported in Tanganyika, British East Africa.

Morocco (French).—For the period September 21–30, 1945, 92 cases of smallpox were reported in French Morocco.

Rhodesia, Northern.—For the week ended September 15, 1945, 167 cases of smallpox were reported in Northern Rhodesia.

Typhus Fever

Morocco (French).—For the period September 21–30, 1945, 72 cases of typhus fever were reported in French Morocco, including 2 cases reported in Casablanca.

Yellow Fever

Bolivia—La Paz Department.—For the month of June 1945, 1 fatal case of yellow fever was reported in La Paz Department, Bolivia.

DEATHS DURING WEEK ENDED OCTOBER 6, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 6, 1945	Correspond-ing week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,313	8,290
Average for 3 prior years	8,508	
Total deaths, first 40 weeks of year	358,239	350,809
Deaths under 1 year of age	601	649
Average for 3 prior years	634	
Deaths under 1 year of age, first 40 weeks of year	24,301	24,733
Data from industrial insurance companies:		
Policies in force	67,791,071	66,756,380
Number of death claims	11,608	11,581
Death claims per 1,000 policies in force, annual rate	8.9	9.1
Death claims per 1,000 policies, first 40 weeks of year, annual rate	10.2	10.1

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States, insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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Public Health Reports

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Public Health Reports

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Printed with the Approval of the Bureau of the Budget as Required by Rule 42 of the Joint Committee on Printing

AN INDUSTRIAL MENTAL HYGIENE PROGRAM FOR FEDERAL EMPLOYEES.[1]

By JOHN W. CRONIN, *Senior Surgeon*,[2] BRUNO SOLBY, *Surgeon (R)*,[3] and WINFIELD S. WILDER, *Senior Assistant Surgeon (R)*,[4] *United States Public Health Service*

INTRODUCTION

A report on a mental hygiene program initiated in Government departments and agencies for Federal employees is presented, with basic suggestions for a psychiatric program in industry. This report is based on the experience gained in the Mental Hygiene Unit of the Employees' Health Service, United States Public Health Service, in Washington, D. C., during the first year of its organization, that is, from December 1943 to December 1944.

This mental hygiene program has been accepted and recognized by management as well as by the employees as a valuable aid in the solution of various problems that interfered with satisfactory job adjustment. There are, necessarily, some factors unique in the present set-up which should be elucidated upon in order to permit an adequate evaluation of the orientation, organization, and techniques used when similar projects are planned for industry. These unique factors we discuss under the following headings: (1) The centralization of mental hygiene services; (2) the present employment situation in Government; and (3) the cultural situation.

The centralization of mental hygiene services.—It is obvious that only organizations which employ a very large number of people can afford a centralized and completely staffed mental hygiene unit. Aside from Government departments, only businesses and industries

[1] From the Hospital Division. The authors wish to express appreciation to their associates for the assistance rendered in making this paper possible.

[2] Medical Director, Employees' Health Service, Washington, D. C.

[3] Chief Psychiatrist, Mental Hygiene Unit, Employees' Health Service, Washington, D. C. (Deceased, Sept. 8, 1945.)

[4] Assistant Psychiatrist, Mental Hygiene Unit, Employees' Health Service, Washington, D. C.

with large-scale production methods fall in this category. The last Social Security Yearbook (1940) lists 340 firms employing over 5,000 people. It can be expected, therefore, that only a limited number of organizations outside of the Federal Government could undertake such a project. It is to be anticipated that the contributions in the field of so-called industrial mental hygiene will come mainly from Government agencies and those private organizations which use large-scale production methods and employ large numbers of workers.

Centralized mental hygiene services might also be established by small business and industrial organizations grouping together for the purpose of maintaining cooperative health services in a specific community. But here another problem has to be taken into consideration. As such services are closely related to personnel management, the establishment of centralized mental hygiene services would postulate a uniform orientation in personnel administration based upon scientific principles. One task, therefore, of mental hygiene services established in larger organizations must be the collection of facts and data which will form a scientific basis for personnel management.

In smaller enterprises, personnel management proceeds more or less on a personal basis. Supervision of a limited group of workers permits better acquaintance with individual problems and often a more direct interest on the part of the employer. Many times this has made for satisfactory job adjustment, loyalty, morale, and efficiency. However, the adequacy of mental hygiene measures under these circumstances will depend on the readiness and ability of the employer to evaluate the various factors pertaining to employee problems and on the quality of the professional advice he is willing or able to obtain. A full- or part-time plant physician with training and experience in psychiatric diagnostic methods might be in a position to carry out a limited mental hygiene program and to acquaint supervisors, foremen, and employees with principles of mental health. No doubt his close contact with supervising personnel will often enable him to aid the individual in making a more satisfactory adjustment. However, under such circumstances, supplementary methods such as psychometric tests could rarely be employed economically. Also, observations made by plant physicians pertaining to mental health and job adjustments of the individual workers, do not reach personnel administrators and physicians with similar assignments in other plants often enough to be generally evaluated. This problem, however, could be solved by establishing subcommittees sponsored jointly by local medical societies and industrial organizations for the purpose of discussing phases of industrial medicine and especially the psychological aspects of personnel management. Such a committee should

include among its members industrial physicians, representatives of management, and representatives of employees.

The development of health benefit organizations by organized groups of workers offering medical services points to another possibility of the development of centralized mental hygiene programs, which under the labor-management committees might also contribute to the collection of data pertinent to the mental health of the employee.

The advantages of centralizing mental hygiene services in industry are twofold:

(1) Industrial mental hygiene is in its initial stages, and relevant data necessary for the establishment of sound groundwork would be more efficiently collected and analyzed in a central set-up. Data of this nature will increase the knowledge of the psychology of the adult, further more efficient personnel management, and, in addition, stimulate the development of more appropriate methods of diagnosis and therapy.

(2) The supporting services of psychometric testing and social work techniques—of immense assistance to the psychiatrist—can be placed at the disposal of small health units economically only when they form a part of a centralized program.

The present employment situation in government.—The manpower problem during the present national emergency has called for the use of all possible means to keep the worker on the job. Signs and symptoms of maladjustment, whether they were expressed in complaints about the job, chronic physical ailments, frequent visits to the health room, or whether they manifested themselves in absenteeism, were seen as contributory to the decrease in efficiency and the work output. All measures that promised relief from such conditions were necessarily encouraged by personnel management.

It was with the objective of increasing the efficiency of Federal workers that the Mental Hygiene Unit of the Employees' Health Service for Federal Government employees in Washington was organized. A few private industries also began to pay increasing attention to the problem of mental health, engaged psychiatrists, and made plans for a thorough study of this problem.

It was, therefore, during the period of full employment and a small labor market that the employer showed an intensified interest in the application of mental hygiene principles to personnel management. Although the relationship between labor supply and requests for mental hygiene services in Federal Government cannot be verified by a statistical analysis of our Mental Hygiene Unit data because of the number of uncontrolled variables, we do get the strong impression that such a definite relationship exists. Various personnel workers in Government departments have confirmed this conclusion.

During the summer of 1944 when the belief in the imminent cessation of hostilities was general (many people expected the war to end within a few months) all plans for the future, of management as well as of workers, were affected by the anticipation of changes in employment. While leaders in business discussed reconversion plans, many Government employees felt that the sooner they could leave Government jobs and enter private industry the better their chance would be to secure for themselves permanent employment. Their jobs in the Government were still frozen; however, in certain instances, release from Government employment could be obtained on the basis of disabilities certified by a physician.

These acute conflicts evidenced themselves either in some kind of physical disability for which no organic cause could be demonstrated or in emotional disturbances which were projected by the employee upon his work setting. The services of the Mental Hygiene Unit were sought to a greater degree by personnel management, because, in spite of all the publicity given to reconversion plans, the actual work load in Government departments not only had not fallen off, but in many instances was actually on the increase. It became imperative to keep people on the job by helping them to make an adjustment adequate to the situation. The Government was threatened by a diminishing labor supply.

The number of referrals to the Mental Hygiene Unit increased. Employees were referred by the staffs of the various departmental health units, physicians, nurses, or by employee counselors and others who had been able to discuss the problem with the employee in greater detail. Often the referral followed the so-called exit interview. In very few instances was there a refusal on the part of the employee to consult the psychiatrist. A few resented further investigation of their problem, no doubt because of a firm determination to leave Government employment. However, it is difficult to evaluate how many of these employees who left Government employment could have been retained in Government service through job adjustment and the utilization of mental hygiene principles in supervision, as well as by interviews in the Mental Hygiene Clinic.

The employees seen in the unit could rarely be termed malingerers. It was not often that the employee had sufficient insight to recognize the cause of his emotional conflicts, or of his physical symptoms. Occasionally he recognized as one of the real issues fear of financial insecurity in the future and the secondary gain which would lie in his escape from a situation which offered him only temporary employment. Though this feeling of insecurity was taken into consideration, it could not be ascribed exclusive etiological significance: other employees whose apprehension was actually caused by the anticipation of future financial insecurity could easily be reassured that their problem would be solved by concerted action of management, labor, and government.

The impression gathered was that the general morale implied in a wartime Government job was weakened by the assumption that individual effort and sacrifice were no longer required. Many people with emotional instability, also those with psychoneuroses and psychosomatic syndromes, had felt it their duty to do their share, especially when other members of the family were in the armed services. It was this attitude, commonly referred to as morale, which had helped the individual to maintain a temporarily high level of integration. But, with the conviction that his contribution would soon not be needed, many symptoms, such as dyspepsia, insomnia, fatigue and exhaustion, feeling of tension, depressions, conflicts with the environment, and so on, which he had previously experienced, i. e., prior to the war, emerged again, often in an enhanced degree, and were rationalized by the individual as the result of his fear of insecurity.

Pessimism concerning the future, as expressed by some of the employees who visited our unit, their lack of response to reassurance, their insistence on the uniqueness of their problems, pointed toward the interpretation of their acute anxieties as symptoms indicating that the individual had only temporarily been socially adjusted and had returned to the earlier isolation which is so characteristic of the neurotic in our culture.

From interviews with the employees referred to our clinic during this period, we were able to formulate two conclusions:

(1) Efficiency on the job and social adjustment as it manifests itself in the interpersonal relationships between the employee and the supervisor as well as between the employee and his fellow workers are proportionate to the general morale, that is, they are to a great degree the result of the recognition of the common goal.

(2) Adjustment problems of the employees are often permitted to exist, to a minor extent, over a long period of time, as long as such problems do not interfere too much with production. Only when they reach such severity that they result in physical illness, absenteeism, or failure on the job, do they come to the attention of the supervisor. Though in some instances sincere interest in the well-being of employees is shown by the supervisor, there is not as yet a general recognition of the fact that supervising implies helping the individual to develop and maintain a state of good mental health. Neither is there provision made by management for sufficient instruction and acquaintance with principles of mental hygiene.

In the ensuing winter of 1944–45, demands for the services of the Mental Hygiene Unit presented a picture which was the reverse of the foregoing description. Proclamations by Government and Army leaders to the effect that the war effort still had to be heightened were given wide publicity. Reconversion plans were postponed. Referrals to the Mental Hygiene Unit diminished in number. More

frequently employees were referred from health units, that is, physicians and nurses in agency health units, rather than from personnel administrators or counselors. We attributed this change in the number of referrals to a contingent improvement in morale among Government workers, in addition to the assurance of prolonged employment in Federal service as well as the uncertainty of opportunities in private industry.

This short survey of the present employment situation as it exists in Government departments and industry is offered with the purpose of pointing out a problem that industrial psychiatry will have to face: the relation between management and labor is essentially an economic relationship. Modern industry becomes interested in health measures, in mental hygiene programs, and in scientific personnel management when the labor market is small and when emergencies dictate the need for greater efficiency. While under such conditions the human factor tends to be emphasized and greater concern with the so-called mental health of the individual is shown by management, such interest will be proportionate to the degree that the individual's contribution is required.

Economic conditions as they influence the labor market will also influence the development of psychiatry. With full employment and an expanding economy, when the goal is high production, the prospects of mental hygiene programs in industry are more auspicious than in a period of scarcity or depression, during which the employee is grateful for an opportunity to make a living and when psychological problems are personal affairs, that is, part of his private life.

The cultural situation.—In the planning of mental hygiene programs for industry, some of the difficulties to be met in the initiation of such programs should be considered. These are difficulties which arise out of the cultural situation.

Personnel management at times may interpret the functions of a mental hygiene service as an intrusion into its realm of authority and operation; personnel directors and supervisors may feel their adequacy questioned. Such attitudes might be expressed as scepticism concerning the necessity of introducing psychiatric principles into business organization or be stated, as in "Business is 'in' for profit and not for psychotherapy." Such attitudes are not necessarily to be ascribed to individual prejudice but are rather to be seen as factors in a cultural situation where status, role, and position are valued as socially desirable goals reached through individual effort, through competition, and carrying social prestige.

The success of a mental hygiene program, therefore, the necessary rapport and the atmosphere of mutual confidence with which alone such a program can be effected, will largely depend upon the tact and skill of the physician entering the field of industrial psychiatry.

Where medical health services are already set up, establishment of a centralized mental hygiene unit as a specialized service has to be interpreted to physicians of the health service who are not specialists in psychiatry. Such interpretation should stress the present need for a centralization of mental hygiene services and emphasize the comparison of such a set-up to the functions of other specialized and centralized medical services where research rather than therapy has been the main object of organization. Rather than having deprived the private physician of his practice and prestige, such research, through collection and analysis of pertinent data, has offered him a scientific basis for more adequate therapeutic measures.

Implicit in the cul ural situation is also the general attitude of the public toward psychiatry, mental hygiene clinics, and all forms of psychiatric treatment. For the tendency to relate the manifestations of mental conflict to the social concepts of irresponsibility, social inadequacy, and constitutional inferiority is still prevalent.

As long as psychiatry was guided by an orientation based upon instinct psychology and the psychology of interpersonal relationships, it had very little to offer to management and the worker, since the analysis of these problems indicated the need for readjustment of factors outside the field of the job situation. But the new emphasis by modern psychiatry on interaction patterns ascribes much greater importance to the actual situation within which the individual interacts with his group. The job thus becomes a major factor in the dynamics of mental health of the adult individual.

Industrial psychiatry stresses the importance of the actual job situation. It also suggests that it is usually the aspiring individual, with a love of life and a desire for greater efficiency, who will look for technical help to make his goals attainable. Yet one must beware of too great optimism as to the immediate readiness of the individual in our society to accept psychiatric advice. For our cultural atmosphere is still that of the pioneer: it still emphasizes the merits of rigid individualism, implying the competency of the strong individual independently to solve his personal problems, and it views with some misgivings the person who must seek help for his difficulties in living.

These are some of the factors that formed the background for the organization of a Mental Hygiene Unit for Government employees. A survey of its functions and services follows.

ORGANIZATION OF THE MENTAL HYGIENE UNIT

The Employees' Health Service was organized in July 1943 as an integral part of the United States Public Health Service, designed to assist Federal employees in maintaining optimal health. Under direct supervision of a Medical Director, the Employees' Health Service was established to provide coordinating and consultative services re-

garding methods, scope, and standards for operating health programs within those government agencies which requested the services of the Employees' Health Service in these matters. This program was to be concerned with all factors in the work environment which affect the health and the productivity of the employee and to emphasize the preventive aspect of medicine. The Employees' Health Service consists of a Mental Hygiene Unit, a Tuberculosis Control Unit, a Public Health Nursing Unit, a Nutrition Education Unit, and a Health Education Unit.

The statement which described the anticipated function of the Mental Hygiene Unit at the time of its establishment in July 1943 was the following:

> To provide facilities for the examination of Federal employees to determine their fitness for employment or to continue on duty; to serve in a consultative capacity for the examination of employees referred by the health services; to instruct physicians and nurses assigned to these health services in the recognition and management of emotional and psychiatric cases; to instruct personnel officers, supervisors, and counselors in emotional hygiene; to conduct lectures and classes for employees; to provide follow-up service and to obtain prompt and efficient disposition of persons temporarily disabled or permanently removed because of emotional or mental illness; and to facilitate the return of former employees to their legal residence.

From the same report is a statement explaining the necessity for this service which concludes:

> Approximately 20 percent of the retirements for disability from the Civil Service are caused by nervous and mental conditions. Persons with these conditions are not only a menace to themselves, but also have a disrupting and demoralizing effect upon other employees with whom they work. Personnel officers have indicated that such a service, if available, would be used extensively. With the exception of the War Department, it is doubtful if any single department or independent establishment has a sufficiently large number of cases to justify the development of such a service, which can be more efficiently operated as a central service.

The present staff of the Mental Hygiene Unit consists of two psychiatrists, two psychiatric social workers, a psychologist, and two clerks.

It was clearly understood that the organization and functions of this unit would be similar to those of the usual mental hygiene clinic without, however, offering psychotherapy except in those cases in which an acute conflict could be ventilated and a brief interpretation of it would have a therapeutic effect. The function of this mental hygiene unit, aside from its educational program, was thus limited to consultative services and referrals to private physicians, mental hygiene clinics, and hospitals in the community whenever intensive psychotherapy was indicated. Examinations to determine fitness for duty, eligibility for compensation, and recommendations for rehabilitation or retirement also were included in its activities.

Very soon, however, it was noted that most of the employees referred to this clinic showed signs and symptoms of poor job adjustment. When the clinic first began its studies of Federal employees, there was a tendency on the part of the staff psychiatrists to consider these symptoms as manifestations of emotional conflicts and personality difficulties arising primarily from life experience outside of the job setting. However, the material revealed in the interviews increasingly indicated the significance of the factors of satisfaction or dissatisfaction with the medium of the employee's productivity, the job itself. The need for more detailed information in regard to the functions and duties involved in the actual job situation was more and more evident. The psychiatrists felt that they must know what skills and special techniques were called for in a given job assignment as well as the physical setting and the personalities involved, in order to evaluate the employee's over-all fitness to perform the duties of the job. This included the evaluation of his physical, psychological, and technical assets and liabilities.

In order to obtain the factual information required for such an evaluation, there was developed a social history outline in which data relating to the employment history, training and promotions, relationship with supervisors, co-workers, and subordinates, and adjustment to the job itself were emphasized to an increasing degree. This information, obtained prior to the visit of the employee to the Mental Hygiene Unit, furnished important leads for the psychiatric interview. It also was of assistance in the final formulation of the problem and in the subsequent recommendation to the referring agency.

In addition to the anticipated services of the Mental Hygiene Unit as a medical clinic, its advisory service to personnel management grew to be of utmost importance. It was possible to demonstrate in case after case the need for adequate information and orientation related to scientific job placement and adjustment if manpower in Federal agencies were to be intelligently utilized and if mental hygiene casualties were to be avoided.

We consider it a relevant observation that this orientation—namely, that the job, and the adjustment that an individual makes to it, is one of the main factors in the mental health of the adult individual and deserves intensified scrutiny—was forced upon the psychiatrist by the employees who consulted him concerning their emotional conflicts. Previous neuropsychiatric training and experience, and the orientation based upon it, inclined the psychiatrist to evaluate such complaints in their symptomatic rather than in their etiological significance. The staff of the Mental Hygiene Unit, however, soon realized that the job situation was of great importance in the formulation of the therapeutic program for the individual. Thus, job adjust-

ment as a fundamental influence for the attainment of a full life by the adult individual is regarded by us as a basic factor upon which industrial mental hygiene is founded.

The demand for scientific personnel management and more adequate supervision is readily seen as emanating from the employee group as well as from management. Personnel workers as well as psychiatrists, however, still believe that progress in employee relations must stem from the initiative of management which appraises methods pertaining to the health, and particularly to the mental health, of the employee only in proportion to the benefits that will accrue to the organization from them, that is, according to results as shown by the profit sheet at the end of the year.

Our experience, however, indicates that in present programs the attempts toward more adequate supervision and management which promote the mental health or the happiness of the employee have to be attributed also, to a great extent, to the demands of those employed. These demands, growing ever clearer in formulation, vary with the kind of occupation. The industrial worker, due to specialization of his function, his technical skills, his recognition of his dependency upon the activity of other members in his group, will be more outspoken in his stipulations than, for instance, the clerical or the agricultural worker. It is this general change in attitude on the part of the employee, in addition to the requirements of management, that explains the emergence of simultaneous yet uncoordinated programs by education specialists, physicians, psychiatrists, social workers, personnel workers, employee organizations and, lately, by veterans, aiming at more adequate mental hygiene measures for the adult productive population.

Because many of the problems which bring Federal employees to the unit have medical as well as job-adjustment implications, it has seemed expedient to have all clinic referrals channeled through the various departmental health units. The medical officer of any Federal agency should know which employees under his jurisdiction are referred to the unit for study in order to be alert to those areas of his organization which produce a disporportionate number of employee maladjustments and to participate in the therapy when indicated. In those agencies which do not employ a medical officer, the supervising nurse in the health unit has the responsibility for making appointments with the clinic, and medical liaison work.

The usual procedure is for an employee counselor or nurse to prepare a social history. In order to facilitate clinic procedure, referring agencies are asked to furnish such data well in advance of the appointment date. Provision is always made for the prompt handling of emergency cases.

The physicians, supervising nurses, and employee counselors of each

agency seeking this consultative service are furnished with an outline, devised by our staff, for a brief, factual, social history. This outline requests information regarding identifying factors such as age, sex, marital status, and job placement, reason for referral, health and medical history, personality, education, employment record, military service, and present home situation. Much of the information requested may be copied from the employee's personnel record which may be supplemented by an interview in the health unit or counseling office. The referring source is cautioned not to question the employee too closely for details, but to report what is already known. This is recommended to prevent the development of resistance on the part of the employee, which may follow too close questioning before he reaches the psychiatrist. What is particularly desired from the agency is an accurate account of the employee's duties and performance on the job, the supervisor's evaluation of his work, and a description of his relationship to his co-workers.

This history material is reviewed by a psychiatric social worker. Further exploration on the part of the representative of the referring agency may be requested. The local Social Service Exchange is then asked to try to identify the name in its files with the result that quite often it is found that the employee or his family has been known to medical and social agencies in the community. Frequently the community agencies are able and willing to cooperate in furnishing information and in offering further services.

In the clinic the employee is usually first interviewed by a staff psychiatric social worker who may supplement the agency social history with further data, particularly concerning the employee's attitude toward his job situation. The employee is encouraged to understand that he is in a neutral medical setting where complete frankness is desirable and where confidences are held inviolate. In this brief initial contact it is also frequently possible for the psychiatric social worker to uncover personality difficulties or social problems which were not mentioned in the social history but which are significant to the psychiatrist.

The employee's interview with the psychiatric social worker prior to the consultation with the psychiatrist has a twofold purpose: (1) Additional data, especially relevant to the job, are elicited by the social worker so that the psychiatrist's interview time is shortened; (2) apprehension experienced by some employees in visiting a psychiatric clinic is mitigated, since this interview is limited primarily to the actual job situation. An atmosphere of confidence and objectivity on the part of the employee is promoted, which contributes to a lessened resistance in the ensuing interview with the psychiatrist.

The freedom with which employees discuss with the psychiatrist their problems—though they are not only related to the job but also

may be of a highly personal nature—must be ascribed to an increased objectivity on the part of the employee, which has been fostered in the preceding interview stressing the job situation. But it also has to be ascribed to the fact that, in this specific setting, the function of the psychiatrist himself is related to the job; this enhances a relationship which hardly could be established by a psychiatrist in private practice.

Because of its specificity for the industrial setting, one wonders whether for this relationship the term "transference" is justified. Freud called transference the emotional reactions of the patient to the therapist, which he interpreted as a repetition of the same emotions and unsolved conflicts which the patient had toward his parents, now transferred to the psychiatrist. No doubt some of these mechanisms play a role also in the relationship which develops between the psychiatrist and the patient in an industrial mental hygiene clinic. However, in addition to the fact that the employee sees in his job the focus of his interests as well as conflicts, the psychiatrist, one of whose functions it is to help him solve his problems as they interfere with his job, assumes the role of a technical expert. The employee, therefore, feels free to ask advice of the psychiatrist and freely supplies any information to help in the solution of his problems. It is a transference on an adult level, supplementing the infantile transference mechanism.

In the majority of instances this relationship and the information available to the psychiatrist prior to the interview aid him in establishing a diagnosis within one or two interviews; in only a few instances were more interviews required. Frequent use is made of psychological tests such as the Wechsler-Bellevue and the Rorschach for differential diagnostic purposes.

If the final diagnosis of psychoneurosis is established, the employee is referred to a private psychiatrist either directly or through the local office of Vocational Rehabilitation. In other instances hospitalization may be necessary. Often various social agencies such as Family Service Association, Travelers Aid Society, Health Security Agency, and others are called upon for assistance in the solution of the individual's problems.

For most employees referred to the clinic the cause of the emotional disturbance is found to be faulty job adjustment. Job placement, adequate supervision, and training are recommended as therapeutic measures in conferences with agency representatives, such as the agency physicians, nurses, and employee counselors. Very encouraging results have been observed when such recommendations have been carried out.

One of the most important functions of the Mental Hygiene Unit during the first year of its organization was seen in the "training of contacts," through interpretation of the clinic findings given to

physicians, nurses, employee counselors, and through lectures on industrial mental hygiene conducted for them.

Since the details of the information and findings in regard to the employee's problem are confidential, the interpretations to those agency representatives who are to play a role in the management of the employee are given in general terms only. On the other hand, an attempt is made to render recommendations for supervisory procedures as specific as possible.

Lectures to physicians, nurses, employee counselors, and personnel officials on industrial mental hygiene are based upon the orientation that the individual's job and his productivity represent the most adequate means for this interaction with the group, and thus that job adjustment is one of the most important factors in the maintenance of mental health. Less emphasis is put on instinct psychology, though its importance is stressed, since instinctual drives are not specific for the adult individual on the job. Emotional conflicts which have induced the individual to choose inadequate means for his interaction with the group are seen to be one of the most frequent causes of poor adjustment; but physical illness, lack of training, poor supervision, faulty job allocation, as they interfere with the individual's productivity, are also ascribed as causative factors for so-called neurotic behavior patterns. The emotional instability resulting from faulty job adjustment, expressed in flighty behavior, crying spells, fainting, mild paranoid ideas, etc., is compared with the rigidity of behavior patterns in neuroses, and the importance of differentiating them is emphasized.

These information courses are no longer limited to physicians, nurses, and employee counselors but are extended also to placement officers and training specialists. In addition to regular staff meetings for the members of the Mental Hygiene Unit, cases that represent important mental hygiene problems as related to the job are discussed at a weekly staff conference of the clinic to which are invited the physicians, nurses, and employee counselors who have taken part in the ferral of the case discussed. The case material which is presented anonymously is used to illustrate basic principles of industrial psychiatry, and discussion is encouraged with the hope that each case presented will suggest sounder methods of handling adult problems. These conferences bring together the health unit personnel, the employee counselor, and representatives of management who need to know one another's problems in the interests of all employees.

The value of these training programs, in spite of the short time they have been offered, has evinced itself in an increasing interest in an orientation that is based on mental hygiene principles and, as a result, in a more adequate selection of cases for referral and a more effective carrying out of therapeutic recommendations.

In addition to the preventive aspects of this industrial mental hygiene program, cooperation between the staff of the Mental Hygiene Unit and the representatives, lay and medical, of the referring governmental agencies have made it possible to keep individuals employed who might be suffering from severe psychoneuroses and who were under psychiatric treatment. This program also accorded assistance to employees who formerly had been hospitalized for mental illness and who were in need of some special supervision and direction in their attempts to adjust themselves to their jobs and to become rehabilitated.

In our recommendations, our conferences, and our lectures, we have stressed the fact that the job adjustment problem of the employee is, in the final analysis, under the direct guidance of his immediate supervisor. It is the supervisor's acceptance of mental hygiene principles as a basic orientation that will establish a sound foundation for personnel management. Physicians, nurses, and personnel workers by transmitting to the supervisors this knowledge of industrial mental hygiene contribute in a positive way to the establishment of a healthful and sound supervisor-employee relationship. The goal is good performance, high productivity, and the mental health of the employee.

CONCLUSIONS

The introduction of mental hygiene programs into industry results from the conviction that the benefits from such programs will accrue to both production and performance as well as to the well-being, physical and mental, of the members of our Nation.

This extension of mental hygiene measures beyond the traditional limits of the medical field of action, into the realm of personnel administration, points to vistas of mental health for our adult productive population that could hardly be conceived at the beginning of this century.

The role of the psychiatrist in such a program adds to his function as physician the function of an educator. The role of the supervisor expands from his function as a production manager to include the function of a leader of those for whose productivity he is responsible.

In addition to the preventive aspects of such a program, an unexplored field of psychotherapy is opened, with possibilities reaching beyond the present-day methods of psychotherapy.

This concept of the role of psychiatry in industry is, however, not to be interpreted as taking the place of efficient personnel management and supervision. It offers a new orientation as basis for methods which personnel management will develop.

THE EFFECT OF TEMPERATURE ON THE SEX RATIO OF *XENOPSYLLA CHEOPIS* RECOVERED FROM LIVE RATS[1]

By LAMONT C. COLE, *Assistant Sanitarian (R), United States Public Health Service*

INTRODUCTION

The tropical rat flea *Xenopsylla cheopis* Rothschild is a species of great importance to man. As early as 1905 Liston (*1*) considered this species to be the principal vector of plague, and authoritative modern opinion (*2*) has come to regard *X. cheopis* as the sole vector involved in the great majority of outbreaks of bubonic and septicemic plague throughout the world. This species is also known to be an important vector of endemic typhus fever in the United States and elsewhere (*3*).

Beginning with the work of the British Indian Plague Commission, started in 1906, it has come to be generally accepted that infectibility of a locality with plague is proportional to the *X. cheopis* population of the locality. It has therefore become standard practice in both plague and endemic typhus control to trap rats and count their ectoparasites for the purpose of estimating the *X. cheopis* population of the community. A number of factors other than the actual size of the flea population have been found to affect the flea counts from rats and considerable progress has been made in interpreting such counts. Factors considered in recent studies (*4*) are season of the year, age and species of the rat, type of premises on which the rat was trapped, whether the rat was trapped indoors or outdoors, and local region within the city in which the rat was trapped.

Another complication in interpreting flea counts arises from the fact, apparently first mentioned by Heiser (*5*), that the fleas spend much time away from the body of the host. The use of the flea count in practical studies inherently assumes that the proportion of the fleas found on the host bears a relatively constant or at least interpretable relation to the total flea population and some experimental tests of this assumption have been made. Hirst (*2*) found that rainy days temporarily lowered the flea counts, Leeson (*6*) found that the proportion of the fleas on the rats varied from 17 to 89 percent, and Buxton (7) found that on mice this proportion varied from 4 to 28 percent with a mean of 12.8 percent, and was apparently independent of temperature and atmospheric moisture. The purpose of the present paper is to provide evidence that under natural conditions the proportion of the *X. cheopis* population on the bodies of the hosts is affected by air temperature and that the two sexes respond unequally to temperature changes.

Relatively few attempts have been made to contrast the *X. cheopis*

[1] From the Division of Public Health Methods.

sexes in practical studies. Hirst (*8*) found that male *X. cheopis* bite oftener but are less efficient than the females as vectors of plague, while Goyle (*9*) considered the males to be better plague vectors. Bacot (*10*), Hirst (*8*), and Goyle (*9*) all found that when the fleas are unfed the females survive longer than the males. However, Leeson (*6*) concluded that the survival of unfed fleas is not influenced by sex. Eskey (*11*, *12*) was perhaps the first to attach practical significance to the sex ratio of *X. cheopis* counts obtained from rats. He considers that the females should normally be in the minority because they spend more time away from the host while depositing eggs, and that a flea count yielding over 40 percent females indicates that environmental conditions are affecting the fleas adversely. In experimental studies Leeson (*6*) found a significantly higher proportion of males than females on the hosts while Buxton (*7*) found a significant predominance of females in experiments conducted at a temperature of 89.6° F.

In analyzing the results of flea surveys any evidence which will help to distinguish between true changes in the flea population resulting from breeding or mortality and transient changes in the flea counts resulting from fleas leaving the bodies of their hosts is of potential importance. If the *X. cheopis* sexes respond differently to factors affecting the proportion of the fleas on the hosts, observations of changes in the sex ratio might furnish important evidence of changes in the balance between corporeal and extracorporeal fleas. Accordingly, while engaged in analyzing data from a rat-flea survey conducted in Mobile, Ala., in 1934, the writer decided to look for systematic changes in the *X. cheopis* sex ratio which might be correlated with meteorologic conditions. Positive results from this investigation have prompted extension of the inquiry to the data from three other cities [2] in separated regions in order to check the constancy of the phenomenon discovered.

RESULTS OF INVESTIGATIONS

The preliminary investigation consisted of selecting from the Mobile data every week, 45 in all, in which over 100 *X. cheopis* were obtained and computing the percentage of females in the catch for each week. Correlation coefficients were then calculated between these data and meteorologic data on temperature, rainfall, relative humidity, and saturation deficiency for the corresponding weeks. The correlation coefficient was statistically significant only in the case of the mean weekly temperature (actually the mean of 14 values, the daily maximum and minimum temperatures) where the correlation of the female percentages with temperature gave the value: $r = -0.843 \pm 0.043$.

[2] Rumreich and Wynn (*4*) describe the project which collected these data.

This is an astonishingly significant correlation when one considers that the temperature data are from Weather Bureau records and are therefore not especially typical of the holes and dwellings where the rats were actually living. The data of other flea surveys also, when casually examined, revealed a tendency toward a high percentage of female *X. cheopis* during the cooler parts of the year and toward an excess of males during the hot weather.

In order to obtain a more critical analysis daily sex ratios were computed as percentages of females in the *X. cheopis* catch for 4 cities and including all days on which 100 or more *X. cheopis* were recorded. Although the sex ratio varied widely from day to day, the total count for the 4 cities gave 36,163 females to 36,283 males, or a sex ratio of 1:1.0033, suggesting that the *X. cheopis* sexes do occur in equal numbers in nature. Correlation coefficients were then calculated between the daily percentages of females and the temperatures of (*a*) the corresponding days and (*b*) the days preceding the capture of the rats. Daily maximum, minimum, and mean temperatures were tried in each case. These results are shown in table 1.

TABLE 1.—*Correlation coefficients of the daily percentage of females in the* X. cheopis *catch from live rats, with daily temperatures* [1]

City	Number of days	Corresponding day			Previous day
		Correlation with maximum temperature	Correlation with minimum temperature	Correlation with mean temperature	Correlation with mean temperature
Mobile, Ala.	120	−0.677**	−0.354**	−0.691**	−0.652**
Jacksonville, Fla.	65	−.713**	−.735**	−.739**	−.675**
Honolulu, T. H.	54	−.339*	−.237	−.300*	−.152
San Diego, Calif.	107	−.119	−.286**	−.220*	−.209*

[1] 1 star (*) indicates that the result is statistically significant ($P<0.05$) by Fisher's z-test. 2 stars (**) indicate a highly significant ($P<0.01$) result.

P expresses the probability, when the true correlation is zero, of obtaining by chance a correlation coefficient as large as or larger than the one obtained.

From table 1, it is seen that in each city there was a statistically significant correlation between the *X. cheopis* sex ratio and the mean temperature of the day on which the rats were caught. All of the coefficients are alike in sign showing that in each case the relative proportion of males increases as the temperature increases. In each city the correlation is greater with the temperature of the day on which the rats were caught than with that of the preceding day. It is therefore suggested that this change in sex ratio is a rapid response to temperature changes, requiring at most a few hours, and that the correlations with the temperature of the previous day result merely from the fact that successive days tend to have similar temperatures.

The changes in sex ratio are obviously too rapid to be due to flea

breeding and for the same reason they can hardly be due to differential mortality of the two sexes. These results must mean that at high temperatures the males spend relatively more time on the body of the host than do the females and that at low temperatures the males spend relatively more time away from the body of the host. Since it is known that high temperatures are deleterious to unfed *X. cheopis* and that the fleas must feed oftener at high temperatures in order to survive (*8*) it appears that the increased percentage of males at high temperatures probably represents an actual increase in the number of males on the hosts rather than a decrease in the number of females. The males then appear to be the more sensitive to the effects of temperature.

The two columns in table 1 showing correlation with maximum and minimum daily temperatures were calculated to ascertain if either of these extremes of temperature could be identified as more influential on the fleas than is the mean temperature. The results are inconclusive. For Mobile and Jacksonville the mean temperature gave the highest correlations and it is the only expression of temperature to yield significant correlations in all four cities; hence it must be the preferred temperature measurement for this purpose until more conclusive data are available. It seems reasonable to expect that in hot weather the daily maximum temperature will eventually be found to exert the greatest effect on the flea counts and that the minimum daily temperature will be found most effective in cold weather.

Another question of interest is whether the *X. cheopis* sex ratio is so closely dependent upon temperature that at a particular mean daily temperature the percentage of females will be similar in each of the four cities. In table 2 the sex ratios are given by intervals of 5° F. for each of the cities. This table shows clearly that at low temperatures there is typically a statistically significant excess of females in the *X. cheopis* catch while at high temperatures the males are typically in excess. In Jacksonville, Mobile, and Honolulu the sexes occur in approximately equal numbers on days when the mean temperature is about 75° F. In San Diego, however, the 1 : 1 sex ratio is attained at a temperature of about 65° F. and in the range from 65° F. to 69.5° F. there is a significant preponderance of males. It thus appears that the male *X. cheopis* are more sensitive to increased temperature in San Diego than in the other cities. This is undoubtedly attributable to coaction with high temperature of other environmental conditions, perhaps dryness, as San Diego has only about one-third as much precipitation annually as any of the other three cities. Bacot and Martin (*13*) showed that high temperatures are most deleterious to fleas under dry conditions.

TABLE 2.—*Percentages of female* X. cheopis *grouped according to the mean temperature of the days on which the hosts were captured* [1]

Mean temperature, °F.	City								
	Jacksonville		Mobile		San Diego		Honolulu		Total
	Number of days analyzed	Percent females	Number of days analyzed	Percent females	Number of days analyzed	Percent females	Number of days analyzed	Percent females	
30-34.5	1	62.8**	--------	--------	--------	--------	--------	--------	62.77**
35-39.5	--------	--------	1	66.9**	--------	--------	--------	--------	66.92**
40-44.5	1	71.1**	4	60.6**	--------	--------	--------	--------	61.81**
45-49.5	2	62.6**	5	59.5**	--------	--------	--------	--------	60.16**
50-54.5	4	61.5**	6	57.6**	6	52.1	--------	--------	56.20**
55-59.5	4	57.3**	5	53.2	19	50.2	--------	--------	51.39*
60-64.5	4	62.1**	9	57.6**	25	49.8	--------	--------	51.59**
65-69.5	5	51.9	10	53.0**	42	47.5**	2	60.6**	48.47**
70-74.5	8	54.9**	14	51.4	12	51.2	33	50.1	51.11
75-79.5	5	50.0	21	48.7*	2	46.7	18	46.4**	47.91**
80-84.5	28	47.2**	38	46.0**	1	54.0	1	54.5	46.96**
85.89.5	3	48.3	5	45.1**	--------	--------	--------	--------	46.05**
90-94.5	--------	--------	2	41.3**	--------	--------	--------	--------	41.27**
Total	--------	51.91**	--------	50.53**	--------	49.11**	--------	49.23	49.92
Total number of *X. cheopis*	--------	9,991	--------	21,508	--------	32,934	--------	8,013	72,446

[1] 1 star (*) indicates that the sex ratio differs significantly (P<0.05) from 50 percent females. 2 stars (**) indicate a highly significant (P<0.01) difference.

The P values for this table were computed as described in (*14*). P expresses the probability of obtaining by chance a sample of the size employed and exhibiting a sex ratio as unequal as or more unequal than that obtained if the true population sex ratio is 1 male : 1 female.

SUMMARY AND CONCLUSIONS

Although it appears probable that the two sexes of *X cheopis* occur in equal numbers in nature, there is a highly significant tendency in each of the four cities investigated for the males to outnumber the females on days with a high mean temperature and for the females to predominate on cold days. This response apparently requires less than 24 hours and is probably the result of more frequent feeding by the males than by the females in hot weather and less frequent feeding by the males in cold weather.

Since in the San Diego survey equal numbers of the two sexes were attained at a lower temperature than in the other three cities it is apparent that mean daily temperature is not the only factor influencing the *X. cheopis* sex ratio.

The number of male *X. cheopis* on the rats is apparently more affected by temperature than is the number of females. Previous studies have shown that both sexes must feed more frequently under adverse conditions of high temperature in order to survive. Therefore, the proportion of the total flea population which is found on the hosts would presumably be somewhat increased by high temperatures. The number of females, however, is found to change less than does the number of males.

The flea count technique in studying epidemiology is an attempt to estimate the total flea population of a locality at a particular time. This study suggests that the count of female *X. cheopis* may bear a more stable relationship to the total flea population than does the total *X. cheopis* count or the count of males. It seems, therefore, that in correlating disease incidence with flea indices derived from flea counts some consideration might be given to an index computed for the female *X. cheopis* only.

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DEATHS DURING WEEK ENDED OCTOBER 13, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 13, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,380	8,390
Average for 3 prior years	8,509	
Total deaths, first 41 weeks of year	360,022	368,109
Deaths under 1 year of age	591	655
Average for 3 prior years	648	
Deaths under 1 year of age, first 41 weeks of year	24,891	25,388
Data from industrial insurance companies:		
Policies in force	67,201,502	66,782,061
Number of death claims	9,011	10,054
Death claims per 1,000 policies in force, annual rate	7.0	7.9
Death claims per 1,000 policies, first 41 weeks of year, annual rate	10.1	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 20, 1945

Summary

Following four consecutive weekly declines, the incidence of poliomyelitis increased during the week, probably due to delayed reports of cases having earlier onset. A total of 618 cases was reported, as compared with 549 last week, 722 for the corresponding week last year, and a 5-year (1940–44) median of 438. Increases occurred in six of the nine geographic areas. The West North Central and the East South Central each reported a decline of only one case and the Mountain area a decline of 12 cases. In 13 of the 22 States reporting 10 or more cases each, 313 cases occurred, as compared with 200 last week, while the other 9 States recorded a decline from 261 to 227 cases. The total of reported cases to date is 11,463, as compared with 16,856 and 10,757, respectively, for the same period in 1944 and 1943, and a 5-year median for the period of 7,949.

A total of 73 cases of meningococcus meningitis was reported, as compared with 75 last week, 175 for the corresponding week last year, and a 5-year median of 61. States reporting the largest numbers are New York, (13), Pennsylvania (9), Ohio and Illinois (5 each), and Michigan and New Jersey (4 each). The total to date is 6,918, as compared with 14,329 and 15,178, respectively, in 1944 and 1943, and a 5-year median of 2,843.

Of the total of 696 cases of diphtheria reported for the week, 512, or about 74 per cent, occurred in the South Atlantic and South Central areas, as compared with 294 in the same areas, or 65 per cent of the total, for the corresponding week last year. The totals for the current week and also for the year to date are more than for the respective corresponding periods of any of the past five years.

Of 9 cases of smallpox reported for the week, 6 occurred in Mississippi. The total to date is 295, as compared with 329 for the same period last year and a 5-year median of 674. Typhoid fever is also below last year's record low. Current figures for influenza and scarlet fever are above those for both the corresponding week last year and the 5-year median.

Deaths during the week in 93 large cities of the United States totaled 9,426 as compared with 8,380 last week, 9,021 for the corresponding week last year, and a 3-year (1942–44) average of 8,754. The cumulative total is 376,048, as compared with 377,220 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended October 20, 1945, and comparison with corresponding week of 1944, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944	
NEW ENGLAND												
Maine	0	0	0	------	------	------	0	1	31	0	0	0
New Hampshire	0	0	0	------	------	------	0	32	1	0	0	0
Vermont	3	0	0	------	------	------	0	1	10	0	0	0
Massachusetts	6	7	5	------	------	------	139	70	96	3	3	8
Rhode Island	2	2	2	9	12	------	0	0	1	0	1	1
Connecticut	0	0	0	------	1	1	18	12	10	1	5	2
MIDDLE ATLANTIC												
New York	10	10	14	[1] 2	[1] 2	[1] 4	36	17	93	13	23	16
New Jersey	1	4	3	3	1	3	13	5	24	4	16	2
Pennsylvania	8	7	9	------	5	1	139	19	105	9	12	7
EAST NORTH CENTRAL												
Ohio	17	8	8	6	8	0	8	6	22	5	19	2
Indiana	9	12	12	8	------	3	5	4	8	0	2	0
Illinois	2	6	18	5	27	6	40	17	17	5	11	3
Michigan [2]	15	11	11	2	------	------	104	12	35	4	10	0
Wisconsin	2	0	1	18	3	16	15	11	51	0	3	2
WEST NORTH CENTRAL												
Minnesota	10	18	10	------	1	1	8	1	10	1	3	0
Iowa	8	4	2	------	------	1	3	4	12	1	0	0
Missouri	5	2	7	------	1	------	5	1	4	3	8	2
North Dakota	2	1	1	2	------	2	1	0	1	0	1	1
South Dakota	4	1	7	------	------	------	2	3	3	0	0	0
Nebraska	3	0	0	------	------	------	1	5	5	0	2	0
Kansas	6	0	2	2	5	2	11	4	4	0	3	0
SOUTH ATLANTIC												
Delaware	2	0	1	------	------	------	1	0	0	0	1	0
Maryland [2]	14	5	5	3	------	1	1	6	5	1	2	3
District of Columbia	0	0	0	1	1	------	2	3	1	1	0	0
Virginia	34	17	22	161	103	104	1	3	20	0	2	2
West Virginia	14	3	8	------	3	10	0	1	2	0	1	1
North Carolina	87	39	67	------	------	2	6	3	3	1	1	0
South Carolina	38	30	30	418	237	237	18	9	9	2	2	0
Georgia	40	17	30	76	20	20	0	2	2	2	3	1
Florida	4	10	10	10	------	3	2	0	2	0	1	0
EAST SOUTH CENTRAL												
Kentucky	13	3	10	------	------	------	20	2	13	0	2	1
Tennessee	07	14	16	5	7	11	1	4	0	3	3	1
Alabama	35	25	20	15	20	20	1	2	3	2	3	1
Mississippi [2]	44	23	10	------	------	------	------	------	------	0	3	1
WEST SOUTH CENTRAL												
Arkansas	32	15	14	32	20	10	2	4	4	0	0	0
Louisiana	15	17	17	------	------	2	0	0	1	[3] 0	0	0
Oklahoma	12	18	13	73	41	30	7	4	2	0	1	0
Texas	61	58	56	1,102	664	520	23	24	17	3	12	1
MOUNTAIN												
Montana	4	2	1	1	3	2	22	4	4	0	1	0
Idaho	0	0	0	6	------	------	76	3	3	0	0	0
Wyoming	0	1	0	------	6	5	5	0	4	0	0	0
Colorado	5	8	8	8	7	10	25	6	11	1	0	0
New Mexico	2	14	0	1	------	1	0	2	7	0	0	0
Arizona	5	0	1	29	52	51	1	3	7	2	0	0
Utah [2]	1	0	0	------	2	2	6	10	4	0	1	1
Nevada	0	0	0	------	------	------	0	0	0	0	0	0
PACIFIC												
Washington	7	10	6	------	------	------	111	12	12	8	3	1
Oregon	8	0	1	2	7	11	7	34	15	0	1	1
California	33	21	21	8	18	18	181	147	48	3	10	5
Total	696	452	482	2,008	1,277	1,143	1,076	513	1,201	73	175	61
42 weeks	12,551	9,720	11,193	80,601	346,018	174,065	107,387	505,404	548,387	[3] 6,918	14,329	2,843

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Correction: Week ended Oct. 6, Louisiana, meningococcus meningitis 3 (instead of 1).

Telegraphic morbidity reports from State health officers for the week ended October 20, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944		Oct. 20, 1945	Oct. 21, 1944	
NEW ENGLAND												
Maine	2	0	0	[5] 19	27	16	0	0	0	0	0	0
New Hampshire	1	2	2	2	9	7	0	0	0	1	0	0
Vermont	2	4	2	4	11	6	0	0	0	0	0	0
Massachusetts	27	82	7	90	119	110	0	0	0	1	4	2
Rhode Island	0	1	1	5	8	4	0	0	0	0	1	0
Connecticut	10	12	5	13	22	23	0	0	0	2	0	0
MIDDLE ATLANTIC												
New York	66	250	39	174	131	131	0	0	0	9	6	11
New Jersey	48	26	11	32	34	54	0	0	0	2	1	2
Pennsylvania	37	48	7	131	112	114	0	0	0	4	9	10
EAST NORTH CENTRAL												
Ohio	23	49	14	197	125	130	0	1	0	0	3	10
Indiana	10	7	5	78	38	76	1	1	0	1	0	2
Illinois	42	10	20	97	131	131	0	0	0	2	2	6
Michigan [3]	14	23	11	108	101	101	0	0	0	0	3	3
Wisconsin	52	15	15	70	36	97	0	0	0	1	0	1
WEST NORTH CENTRAL												
Minnesota	14	20	11	30	39	45	0	0	0	1	0	0
Iowa	18	13	4	40	31	43	0	0	0	0	1	1
Missouri	17	13	5	56	33	39	0	0	0	6	3	3
North Dakota	0	0	1	11	9	0	0	0	0	2	0	2
South Dakota	0	0	0	2	4	11	0	0	0	0	0	0
Nebraska	5	3	3	7	33	13	1	0	0	0	1	0
Kansas	14	1	8	41	60	62	0	0	0	1	0	3
SOUTH ATLANTIC												
Delaware	0	3	0	4	3	5	0	0	0	3	1	1
Maryland [3]	8	10	1	45	51	35	0	0	0	1	2	5
District of Columbia	4	9	0	8	9	14	0	0	0	1	0	0
Virginia	9	28	0	106	93	42	0	0	0	8	4	6
West Virginia	3	15	3	77	105	64	0	0	0	3	2	3
North Carolina	11	20	5	95	70	93	0	0	0	1	2	5
South Carolina	3	1	1	8	10	11	0	0	0	0	3	3
Georgia	10	6	2	31	24	33	0	0	0	2	3	4
Florida	9	1	1	7	10	6	0	0	0	3	2	1
EAST SOUTH CENTRAL												
Kentucky	3	11	5	55	10	40	0	0	0	10	4	4
Tennessee	17	2	2	81	81	81	0	0	0	6	4	5
Alabama	3	0	2	24	30	31	0	1	0	0	0	2
Mississippi [3]	4	1	1	23	15	15	6	0	0	0	7	4
WEST SOUTH CENTRAL												
Arkansas	4	1	1	26	17	12	0	0	0	4	5	5
Louisiana	10	3	1	15	12	9	0	0	0	8	3	4
Oklahoma	11	2	2	15	21	21	0	0	0	0	1	5
Texas	18	3	7	110	47	42	1	0	0	13	14	14
MOUNTAIN												
Montana	7	1	1	14	8	12	0	1	0	1	0	0
Idaho	1	2	0	19	31	7	0	0	0	1	2	0
Wyoming	0	0	1	0	3	3	0	0	0	0	0	0
Colorado	3	0	2	21	38	22	0	1	0	2	2	3
New Mexico	0	3	2	12	13	8	0	0	0	0	3	6
Arizona	1	2	0	6	8	2	0	0	0	3	2	0
Utah [3]	5	0	1	10	10	9	0	0	0	0	0	0
Nevada	0	0	0	0	0	0	0	0	0	0	0	0
PACIFIC												
Washington	15	10	10	87	46	25	0	0	0	1	2	2
Oregon	1	11	5	19	18	16	0	0	0	0	1	1
California	46	15	15	187	157	89	0	0	0	3	5	5
Total	618	722	438	2,280	2,041	2,041	9	5	9	103	108	177
42 weeks	11,463	16,856	7,949	[5] 140,251	158,104	111,119	295	320	974	4,160	4,083	5,866

[3] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately, as follows: Connecticut 2; California 1.
[5] Correction: Week ended Oct. 6, Maine, scarlet fever, 26 (instead of 0).

Telegraphic morbidity reports from State health officers for the week ended October 20, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Whooping cough: Week ended— Oct. 20, 1945	Whooping cough: Week ended— Oct. 21, 1944	Whooping cough: Median 1940-44	Week ended Oct. 20, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	28	4	9	0	0	0	0	0	0	0	1
New Hampshire	7	0	1	0	0	0	0	0	0	0	0
Vermont	10	19	19	0	0	0	0	0	0	0	2
Massachusetts	136	88	94	0	0	0	1	0	0	0	0
Rhode Island	15	8	8	0	1	0	0	0	0	0	0
Connecticut	46	56	56	0	7	0	0	0	0	1	12
MIDDLE ATLANTIC											
New York	263	177	287	8	20	0	2	0	0	0	4
New Jersey	151	44	123	0	0	12	1	1	0	0	2
Pennsylvania	198	76	233	0	0	0	2	0	0	0	5
EAST NORTH CENTRAL											
Ohio	77	92	165	0	0	0	0	0	0	1	4
Indiana	37	12	17	1	0	2	2	0	0	0	2
Illinois	79	83	149	3	1	0	2	1	1	0	6
Michigan [1]	111	49	231	1	8	0	0	0	0	0	6
Wisconsin	93	64	161	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota	6	54	42	0	0	0	0	0	0	0	1
Iowa	4	6	16	0	0	0	0	0	0	0	0
Missouri	2	12	13	0	0	0	0	1	0	0	1
North Dakota	0	3	11	0	0	0	0	0	0	0	0
South Dakota	1	2	2	0	0	0	0	0	0	0	1
Nebraska	3	4	6	0	0	0	0	0	0	0	0
Kansas	12	13	33	0	0	0	0	0	0	0	5
SOUTH ATLANTIC											
Delaware	3	2	2	0	1	0	0	0	0	0	0
Maryland [3]	48	66	62	0	0	1	0	0	0	0	0
District of Columbia	3	10	4	0	0	0	0	0	0	0	0
Virginia	33	6	24	0	0	90	0	0	0	0	2
West Virginia	6	14	16	0	0	0	0	0	0	0	0
North Carolina	40	48	99	1	1	0	0	0	0	8	1
South Carolina	73	26	26	0	7	0	0	0	0	14	0
Georgia	16	0	11	1	4	1	0	0	1	24	3
Florida	4	4	6	3	2	0	0	0	0	12	0
EAST SOUTH CENTRAL											
Kentucky	22	12	40	2	0	0	0	0	1	0	0
Tennessee	25	11	31	0	0	2	3	2	0	4	0
Alabama	9	10	16	0	0	0	0	0	0	10	1
Mississippi [3]	-------	-------	--------	0	0	0	0	0	0	3	2
WEST SOUTH CENTRAL											
Arkansas	10	3	15	2	4	0	0	0	0	0	2
Louisiana	1	2	2	[6] 1	[6] 1	0	0	0	0	[6] 4	1
Oklahoma	5	4	7	2	0	0	0	0	0	0	3
Texas	84	150	115	14	225	20	0	0	0	26	7
MOUNTAIN											
Montana	1	17	14	0	0	0	1	0	0	0	0
Idaho	4	1	4	0	0	0	0	0	0	0	0
Wyoming	0	13	4	0	0	0	0	0	1	0	0
Colorado	15	12	19	0	0	0	1	0	0	0	0
New Mexico	1	2	12	3	5	4	0	0	0	0	0
Arizona	11	20	7	0	0	32	0	0	0	0	1
Utah [3]	5	7	18	0	0	0	0	0	0	0	0
Nevada	12	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	29	6	43	0	0	0	0	0	0	0	0
Oregon	14	7	13	0	0	0	0	0	0	0	10
California	140	88	181	3	4	0	6	0	0	3	1
Total	1,898	1,407	2,780	45	291	164	21	3	4	110	89
Same week, 1944	1,407	------	--------	55	835	226	9	1	5	87	73
Average, 1942-44	2,172	------	--------	41	472	150	12	[7] 1	4	[7] 110	-------
42 weeks: 1945	102,649	------	--------	1,570	21,285	9,458	542	450	621	4,065	3,869
1944	77,889	------	--------	1,484	19,126	7,499	552	440	464	4,131	3,286
Average, 1942-44	126,557	------	[7] 147,130	1,409	14,488	6,640	535	[7] 440	629	[7] 2,902	-------

[3] Period ended earlier than Saturday.
[6] Correction, week ended Oct. 6, Louisiana: amebic dysentery 7 (instead of 1); bacillary dysentery 21 (instead of 10); endemic typhus fever 14 (instead of 11).
[7] 5-year median, 1940–44.

Anthrax: Idaho 1 case. *Psittacosis:* Illinois 1 case (Chicago); Maryland 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended October, 13 1945

This table lists the reports from 89 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	------	0	1	0	2	2	2	0	0	4
New Hampshire:												
Concord	0	0	------	0	0	0	2	1	0	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	0	0	------	0	2	0	9	18	15	0	0	33
Fall River	0	0	------	0	1	0	0	1	3	0	0	1
Springfield	0	0	------	0	1	0	0	0	3	0	0	1
Worcester	0	0	------	0	20	0	9	1	4	0	0	3
Rhode Island:												
Providence	0	0	------	0	0	0	2	0	2	0	0	6
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	9	3	0	0	0
Hartford	0	0	------	0	1	0	1	1	1	0	0	3
New Haven	0	0	------	0	0	0	1	0	0	0	0	4
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	1	0	2	5	3	0	1	7
New York	4	2	------	0	6	2	38	11	36	0	4	56
Rochester	0	0	------	0	0	0	1	7	3	0	1	10
Syracuse	0	0	------	0	0	0	2	0	9	0	0	18
New Jersey:												
Camden	0	0	------	0	0	2	1	2	0	0	0	0
Newark	0	1	1	0	1	1	1	5	1	0	0	26
Trenton	0	0	------	0	0	0	1	0	0	0	0	0
Pennsylvania:												
Philadelphia	0	0	1	1	8	2	16	11	19	0	2	55
Pittsburgh	1	1	------	0	0	0	4	5	7	0	0	8
Reading	0	0	------	0	3	0	1	1	2	0	0	1
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	5	0	------	0	1	3	9	5	9	0	0	9
Cleveland	0	0	------	0	0	2	6	6	13	0	1	22
Columbus	2	0	------	0	1	0	0	4	9	0	0	2
Indiana:												
Fort Wayne	0	0	------	0	0	0	0	0	1	0	0	0
Indianapolis	6	0	------	0	0	0	3	0	9	0	0	7
South Bend	0	0	------	0	0	0	0	1	1	0	0	2
Terre Haute	0	0	------	0	0	0	0	0	1	0	0	0
Illinois:												
Chicago	1	0	1	0	50	4	18	11	31	0	0	33
Springfield	0	0	------	0	0	0	3	0	2	0	0	1
Michigan:												
Detroit	5	0	1	0	21	0	11	3	26	0	1	57
Flint	0	0	------	0	8	0	3	0	3	0	0	2
Grand Rapids	0	0	------	0	0	0	1	1	4	0	1	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	1	1	0	0	0
Milwaukee	1	0	------	0	1	0	0	13	9	0	0	2
Racine	0	0	------	0	0	0	0	0	2	0	0	2
Superior	0	0	------	0	1	0	0	0	0	0	0	3
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	2	0	2	0	0	0
Minneapolis	0	0	------	0	2	0	4	7	10	0	0	6
St. Paul	1	0	------	0	3	0	6	2	5	0	0	2
Missouri:												
Kansas City	1	0	------	0	3	1	2	1	4	0	0	2
St. Joseph	0	0	------	0	0	0	0	0	0	0	0	0
St. Louis	2	0	2	0	0	2	9	9	11	0	0	7

City reports for week ended October 13, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	1	0	------	0	0	0	2	1	1	0	0	0
Kansas:												
Topeka	0	0	------	0	2	0	0	0	2	0	0	0
Wichita	0	0	------	0	0	0	7	0	1	0	0	4
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	2	0	1	0	1	1
Maryland:												
Baltimore	16	0	------	0	1	1	3	0	10	0	0	38
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	1	0	0	0	0	0
District of Columbia:												
Washington	0	0	------	0	0	0	7	6	9	0	0	7
Virginia:												
Lynchburg	1	0	------	0	0	0	0	1	1	0	0	2
Richmond	1	0	------	0	0	1	1	6	9	0	1	0
Roanoke	0	0	------	0	0	0	0	0	3	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	1	0	0	0
Wheeling	0	0	------	0	0	0	2	1	1	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	2	0	0	0	0	3
Wilmington	1	0	------	0	0	0	3	0	1	0	0	1
Winston-Salem	0	0	------	0	0	0	0	0	7	0	0	5
South Carolina:												
Charleston	0	0	2	1	0	0	0	0	1	0	0	0
Georgia:												
Atlanta	0	0	1	1	0	1	3	0	0	0	0	0
Brunswick	0	0	------	0	0	0	0	0	0	0	0	0
Savannah	0	0	------	0	0	0	0	0	1	0	0	0
Florida:												
Tampa	0	0	------	0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	------	1	0	0	3	5	6	0	0	2
Nashville	0	0	------	0	1	0	2	0	2	0	0	8
Alabama:												
Birmingham	2	0	1	0	0	1	5	0	3	0	0	1
Mobile	3	0	------	1	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	0	0	0	0	0	0
Louisiana:												
New Orleans	2	0	5	0	1	0	7	0	2	0	0	2
Shreveport	3	0	------	0	0	0	2	3	1	0	1	0
Texas:												
Dallas	0	0	------	0	0	0	1	2	4	0	0	0
Galveston	0	0	------	0	0	0	1	0	0	0	0	0
Houston	1	0	------	0	0	0	4	1	2	0	0	0
San Antonio	0	0	------	0	0	0	3	1	0	0	0	5
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	6	0	0	0	0
Great Falls	0	0	------	0	0	0	0	0	1	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	1	0	2	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	2	0	0	0	0	0
Colorado:												
Denver	4	0	1	0	2	0	3	0	8	0	0	9
Pueblo	1	0	------	0	0	0	1	0	0	0	0	1
Utah:												
Salt Lake City	0	0	------	0	2	0	0	2	2	0	0	5

City reports for week ended October 13, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	0	21	0	4	1	8	0	0	2
Spokane	1	0	------	0	0	0	1	0	3	0	0	1
Tacoma	1	0	------	0	30	0	1	0	3	0	0	0
California:												
Los Angeles	3	0	2	2	4	0	2	7	17	0	0	13
Sacramento	2	0	------	0	2	0	1	0	4	0	0	19
San Francisco	1	0	------	0	35	0	4	2	5	0	0	6
Total	76	4	18	7	239	23	256	189	386	0	14	525
Corresponding week, 1944	89	------	30	16	140	------	298	------	420	0	12	416
Average, 1940-44	77	------	53	[1] 17	[2] 246	------	[1] 302	------	467	0	28	873

[1] 3-year average, 1942-44. [2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: Boston, 2; New York, 3; Chicago, 2; St. Joseph, 2; Baltimore, 1; Los Angeles, 1.

Dysentery, bacillary.—Cases: New Haven, 1; New York, 14; Chicago, 1; Detroit, 5; Atlanta, 2; Nashville, 1; Los Angeles, 2.

Dysentery, unspecified.—Cases: Baltimore, 1; Richmond, 1; San Antonio, 2.

Typhus fever, endemic.—Cases: Kansas City, 1; Charleston, S. C., 4; Atlanta, 6; Savannah, 4; Nashville, 2; Little Rock, 1; New Orleans, 10; Shreveport, 1; Dallas 3; Houston, 2; San Antonio, 5; Los Angeles, 3.

Rates (annual basis) per 100,000 population, by geographic groups, for the 89 cities in the preceding table (estimated population, 1943, 34,366,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	0.0	0.0	0.0	68	0.0	68.0	86.3	86	0.0	0.0	144
Middle Atlantic	2.3	1.9	0.9	0.5	9	3.2	31.0	21.8	37	0.0	3.7	84
East North Central	12.2	0.0	1.2	0.0	50	5.5	32.8	27.4	74	0.0	1.8	86
West North Central	10.1	0.0	4.0	0.0	20	6.0	64.4	40.2	72	0.0	0.0	42
South Atlantic	31.1	0.0	4.9	3.3	3	4.9	42.5	22.9	74	0.0	3.3	93
East South Central	35.4	0.0	5.9	11.8	6	5.9	64.9	29.5	65	0.0	0.0	35
West South Central	17.2	0.0	14.3	0.0	3	0.0	51.7	20.1	26	0.0	2.9	20
Mountain	39.7	0.0	7.9	0.0	40	0.0	71.5	63.5	87	0.0	0.0	119
Pacific	15.8	0.0	3.2	3.2	145	0.0	20.6	15.8	63	0.0	0.0	65
Total	11.6	0.6	2.7	1.1	36	3.5	33.9	28.8	59	0.0	2.1	80

TERRITORIES AND POSSESSIONS

Puerto Rico

Notifiable diseases—4 weeks ended October 6, 1945.—During the 4 weeks ended October 6, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	5	Ophthalmia neonatorum	1
Cerebrospinal meningitis	2	Poliomyelitis	1
Chickenpox	16	Ringworm	1
Diphtheria	69	Syphilis	403
Dysentery, unspecified	2	Tetanus	5
Filariasis	4	Tetanus, infantile	2
German measles	5	Tuberculosis (all forms)	603
Gonorrhea	248	Typhoid and paratyphoid fever	29
Influenza	39	Typhus fever (murine)	16
Malaria	458	Undulant fever	1
Measles	43	Whooping cough	37
Mumps	2		

Virgin Islands of the United States

Notifiable diseases—July–September 1945.—During the months of July, August, and September 1945, cases of certain notifiable diseases were reported in the Virgin Islands as follows:

Disease	July	August	September
Gonorrhea	13	5	6
Hookworm disease	1		1
Measles	1		
Mumps	1		
Schistosomiasis			1
Syphilis	23	10	7
Trachoma			1
Tuberculosis (pulmonary)		1	
Typhus fever (murine)	2	1	

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended September 29, 1945.—During the week ended September 29, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		7		10	35	10	11	32	35	140
Diphtheria		2		22	3	6		1		34
Dysentery:										
Bacillary						1				1
Unspecified					1					1
German measles					7			1	1	9
Influenza		7			26					33
Measles				30	34		4	6	45	119
Meningitis, meningococcus		1			3					4
Mumps				19	46	6	2	21	15	109
Poliomyelitis		1	1	6	[1] 8	1			2	[1] 19
Scarlet fever	1	5	8	27	51	14	6	14	7	133
Tuberculosis (all forms)		7	1	254	46	16	29	9	82	444
Typhoid and paratyphoid fever				20	2	1			3	26
Venereal diseases:										
Gonorrhea		45	18	134	136	51	44	42	68	538
Syphilis		17	9	135	89	16	7	11	38	322
Other forms				2						2
Whooping cough		13	1	137	48	3		4	7	213

[1] Includes 2 cases, delayed reports.

JAMAICA

Notifiable diseases—4 weeks ended September 22, 1945.—During the 4 weeks ended September 22, 1945, cases of certain notifiable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis		2	Poliomyelitis		1
Chickenpox	1	7	Scarlet fever		1
Diphtheria	5	9	Tuberculosis	32	75
Dysentery, unspecified	13	13	Typhoid fever	6	117
Erysipelas	1	2	Typhus fever (murine)	2	
Leprosy		2			

NEW ZEALAND

Notifiable diseases—4 weeks ended September 8, 1945.—During the 4 weeks ended September 8, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	16	2	Ophthalmia neonatorum	1	
Dengue	1		Puerperal fever	3	
Diphtheria	86	3	Scarlet fever	382	2
Dysentery:			Tetanus	3	2
Amebic	2		Trachoma	4	
Bacillary	13		Tuberculosis (all forms)	258	52
Erysipelas	21		Typhoid fever	7	1
Hookworm disease	1		Undulant fever	1	
Malaria	8				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-named diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday of each month.

Cholera

Ceylon—Trincomalee District.—For the week ended October 13, 1945, 13 cases of cholera with 11 deaths, were reported in the Trincomalee District, Ceylon. The source of infection was undetermined.

Plague

Ecuador.—During the month of August 1945, 5 cases of plague with 2 deaths were reported in Canar Province, and 1 case of plague was reported in Loja Province, Ecuador. These cases of plague are in addition to those previously published.

Smallpox

Brazil.—Smallpox (including alastrim) has been reported in the State of Rio Grande do Sul, Brazil, as follows: July, 139 cases; August, 142 cases; September, 41 cases.

Colombia—Antioquia Department.—For the month of July 1945, 139 cases of smallpox with 1 death were reported in Antioquia Department, Colombia.

Typhus Fever

Belgian Congo.—For the week ended September 29, 1945, 21 cases of typhus fever were reported in Belgian Congo.

Colombia—Antioquia Department.—For the month of July 1945, 107 cases of typhus fever with 6 deaths were reported in Antioquia Department, Colombia.

Ecuador.—For the month of September 1945, 57 cases of typhus fever with 9 deaths, were reported in Ecuador. These include 11 cases reported in Ambato, 11 cases with 2 deaths in Riobamba, 10 cases with 2 deaths, in Quito, and 2 cases of murine typhus fever reported in Guayaquil.

Yellow Fever

Peru—Junin Department—Satipo.—According to a report dated October 11, 1945, 3 cases (unconfirmed) of yellow fever were reported in Satipo, Junin Department, Peru.

Venezuela—Zulia State—Municipality of Rosario—Santa Marta Posesion (Haciendo).—Telegraphic information dated October 11, 1945, reported 1 fatal case of yellow fever in Santa Marta Posesion (Haciendo), Municipality of Rosario, Zulia State, Venezuela.

DEVICES FOR REDUCING HEALTH DEPARTMENT RECORDS AND REPORTS

A REVIEW

Traditionally, supporting bodies have required of the agencies they aid financially, periodic, detailed enumerations of their operational procedures. That reports of this nature are unwarrantedly burdensome to the grantee without being particularly revealing to the agency collecting the information is the thesis of an article [1] recently released by the United States Public Health Service.

Several opposing viewpoints as to what characterizes data best suited for administration of a grant-in-aid program are presented. The authors take the position that the information required must be essential to carrying out the functions with which the receiving office is charged, that it must be presented in a form requiring a minimum of time and effort in preparation, and that it must be collected no more frequently than is absolutely necessary. Some of the basic fallacies in current reporting requirements of grant-in-aid agencies are outlined, and a suggested reporting system designed to eliminate a number of these objections is presented. It is stated that for this purpose the supporting agency should have knowledge of the health problems being met, knowledge of what is being done with the money requested, and knowledge of how this service plan is adapted to community needs.

The system offered consists of three formal reporting instruments to be required annually: (1) An Annual Combined Report and Plan, (2) an Advance Estimate of Funds Needed for Operation of Health

[1] Devices for reducing health department records and reports. By Joseph W. Mountin and Evelyn Flook. Supplement No. 187 to the Public Health Reports.

Programs, and (3) an Inventory of Public Health Personnel, Facilities, and Services of Local Health Jurisdictions. The first of these would replace two separate narrative documents in current use and would follow a uniform pattern expressed in a common language, whereas the present narratives are characterized chiefly by inconsistency and lack of continuity. It would serve as a contract between the grantor and grantee with respect to current and contemplated performance. The second report form is constructed to provide the grant-in-aid agency with information needed to defend requests for appropriations for improvement and expansion of health services. From the information submitted, it will be possible to forecast which programs will require additional funds and the specific purposes for which these additional amounts are to be expended. The third report will aid the supporting agency in evaluation of health staffs, facilities, and services in identified localities. Such evaluation is necessary to the shaping of a health program and is possible only if the current distribution is known. Not only does this report provide for a summary of personnel, facilities, and services of each reporting health department, but also corresponding information concerning other official and voluntary agencies of the community would be included. In the past, detailed statistical accounts of services performed by local health departments have not adequately shown whether or not the gaps are taken care of by other community agencies. It is proposed that the inventory described should serve as a substitute for the quarterly count of admissions to service, clinic visits, nursing visits, sanitation inspections, and the like which has been required for the past decade.

Illustrations of the suggested report forms, together with a brief explanation of how they should be completed, are included in the article. The system has been tested experimentally in a number of States and has been approved by the Conference of State and Territorial Health Officers for extension to all States.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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STUDIES OF THE ACUTE DIARRHEAL DISEASES [1]

X D. FURTHER STUDIES ON THE RELATIVE EFFICACY OF SULFONAMIDES IN SHIGELLOSIS

By JAMES WATT, *Surgeon, United States Public Health Service,* and SAM D. CUMMINS, *Resident in Medicine and Pathology, Shreveport Charity Hospital*

Previously published sections (*1*) of this paper have discussed the value of sulfonamides in the treatment of *Shigella* infection observed in institutional inmates, together with a preliminary report on clinical observations in a general hospital. Institutional studies provide an accessible and easily controlled source of individuals infected with these organisms. One disadvantage of this type of study is that a large proportion of the discovered infections are asymptomatic; another is that frequently only a single strain of organism may be involved in an outbreak. If a particular strain is resistant to sulfonamides, a large percentage of the cases will not respond to treatment; on the other hand, if a susceptible strain is involved, a very favorable result will be obtained. Therefore, as a complement to the institutional studies, a series of cases was observed and treated in two large general hospitals. These patients were chosen at random in the course of routine hospital admissions.

METHODS

By arrangement with the various services responsible for the care of patients, the following procedures were adopted: A stool culture was obtained on admission from every patient suffering with acute diarrhea. Rectal swab cultures were taken by the intern during his examination, planted immediately on S. S. agar and the plates sent to the laboratory for incubation (*2*). Treatment with the particular sulfonamide then being studied was immediately started. Daily

[1] From the Division of Infectious Diseases, National Institute of Health, and the Charity Hospital of Louisiana at New Orleans and at Shreveport, aided by a grant from the Division of Medical Research of the Office of Scientific Research and Development

follow-up cultures were obtained by personnel employed for this purpose until the patient was clinically and bacteriologically well. Whenever possible five consecutive negative cultures were obtained before the patient was discharged, and all cases counted as negative in this analysis had at least three consecutive negative cultures.

Three different sulfonamides were used: sulfadiazine, sulfapyrazine and sulfamethazine. A standard dose was employed throughout; that for adults was 1 gm. every 4 hours until two negative cultures were obtained; children were given 0.064 gm. per pound of body weight daily for this same period.

The patients were all admitted through regular hospital channels, and for this reason the cases would be considered severe when compared with those seen in the general population. There were, however, a number which would be considered mild illnesses.

Bacteriological studies were used as the most reliable test of the efficacy of the various sulfonamides. No untreated controls were included in this study, since previous experience has shown the value of sulfonamide therapy in these infections, and a large group has been reported in other papers of this series. A second measure of efficacy used is the observed case-fatality rate compared with that seen in our earlier studies in New Mexico and Georgia (*3*). The two groups are not strictly comparable, since the earlier group was obtained, in part, by case-finding methods designed to detect a relatively large number of mild infections in the general population, thereby lowering the case-fatality rate. Balancing this, at least in part, is the fact that most of the cases in New Mexico and Georgia were treated at home and those reported here, while on the average more severe, were all cared for in modern hospitals where the many nonspecific aids to recovery would presumably be more efficiently applied. If these two factors are kept in mind, it is believed that useful conclusions may be drawn from this comparison.

Stool cultures of 333 cases of acute diarrhea were positive for *Shigella*, 238 being positive for one of the Flexner group, and 95 for *Shigella sonnei*. Sulfadiazine was used in 195 cases, sulfapyrazine in 103 cases, and sulfamethazine in 36 cases. The sulfamethazine series is small because a high proportion of severe complications, including one death, was noted and therefore the use of sulfamethazine was discontinued.

RESULTS

The cases of acute diarrheal disease found positive for *Shigella* are shown in table 1 according to the treatment received, the type of organism isolated, and the duration of positive cultures after treatment was started. (Six fatal cases are excluded from this tabulation.) All three sulfonamides quickly reduced the number of positive cultures, and the observed differences in efficacy were not significant.

TABLE 1.—*Percentage of individuals with persisting positive cultures in cases of shigellosis treated with different sulfonamides* [1]

Drug used	Type of *Shigella*	Total recovered cases	Before treatment	Percentage with persisting positive cultures						
				Day after treatment						
				1	2	3	4	5	7	10
Sulfadiazine	Flexner	130	100	68	31	16	10	6	5	4
	Sonne	61	100	85	54	44	33	23	18	15
Sulfapyrazine	Flexner	79	100	67	27	8	4	1	0	0
	Sonne	22	100	86	68	45	27	23	23	18
Sulfamethazine	Flexner	26	100	65	27	16	4	0	0	0
	Sonne	9	100	78	45	34	23	23	23	12
All drugs	Flexner	235	100	67	29	13	7	4	3	2
	Sonne	92	100	85	53	41	29	22	18	15

[1] 6 fatal cases excluded from this tabulation. These are discussed individually and under case-fatality rates.

An additional index of effectiveness—a count of suspicious colonies—was used. The usual admission cultures showed 500 and more colonies of pathogens per plate. On the other hand, positives recorded after 48 hours of therapy usually had not more than 10 to 15 such colonies. Thus, those positives which remained after 48 hours were less efficient carriers of infection, even though their stool cultures continued positive.

Attention is called to one important difference in response to treatment shown in the table. Infections with the Flexner group of organisms responded much more quickly and completely than did those with *Shigella sonnei*. In the group of Flexner cases only 5 resistant strains were encountered; whereas in the smaller series of Sonne infections there were 14 such cases.

This series was also analyzed according to severity and duration of illness before and after treatment. With all sulfonamides used, cases classed as moderate on clinical grounds alone became negative bacteriologically more quickly on the average than the severe cases. In Flexner infections for example only 7 of the moderate cases (total 99) were positive after 72 hours' treatment, while 28 of the severe ones (total 146) showed positive cultures. In all, 19 resistant cases of Flexner and Sonne infections (positive after 10 or more days' treatment) were seen. Six were classed as moderate (142 total cases) and 13 severe (185 total cases).

The average time required for bacteriological cure did not vary significantly with the duration of illness before treatment began. This is indicative of the value of the sulfonamides since *Shigella* infections are usually self-limited. Presumably, therefore, if the sulfonamide therapy was ineffective, those cases with the longer historical duration would on the average show a shorter period of positive cultures while under observation.

Usually clinical recovery paralleled the bacteriological response and was on the average 1 day later than the latter. Several important exceptions to this rule were seen. All 19 cases classed as having resistant infections were clinically well 10 days or more before any negative cultures were obtained. Conversely, bacteriological cure was observed a number of times as much as a week before clinical recovery was complete. This was usually seen in those patients giving a history of bloody mucoid stools. One child continued to pass grossly bloody stools for 8 days after bacteriological recovery, although the blood progressively decreased in amount. Abnormalities for the most part were confined to the microscopic demonstration of blood and cellular exudate in the stool for several days after cultures were negative. The explanation of this finding is shown in the autopsy record of cases 2 and 3 below. Healing ulcers of the bowel were found 8 and 7 days, respectively, after the last positive culture.

The case-fatality rate observed in this series is shown by age in table 2 and is compared with that seen in New Mexico and Georgia.

TABLE 2.—*Case-fatality rates by age in sulfonamide-treated group and group observed in New Mexico and Georgia without sulfonamide therapy*

Years	Locality	Age	Flexner[1]			Sonne			Total		
			Number cases	Number deaths	Percent deaths	Number cases	Number deaths	Percent deaths	Number cases	Number deaths	Percent deaths
1943-44	New Orleans and Shreveport Charity Hospitals	Under 1	62	1	1.6	30	2	6.8	92	3	3.3
		1-2	60	1	1.7	22	1	4.5	82	2	2.4
		2 and over	116	1	.9	43	0	0	159	1	.6
		All ages	238	3	1.3	95	3	3.1	333	6	1.8
1937-39	New Mexico and Georgia hospitals and general population cases	Under 1	64	21	31.2	24	6	25.0	88	27	30.7
		1-2	77	9	11.7	21	1	4.8	98	10	10.2
		2 and over	183	0	0	55	0	0	238	0	0
		All ages	324	30	9.2	100	7	7.0	424	37	8.7

[1] Includes Newcastle strains since these are antigenically related to the Flexner group and respond in the same way therapeutically.

The rate in the sulfonamide-treated series is definitely lower than that seen previously. At least one of the deaths (case 2) perhaps should not be included in this tabulation, since the child had two diseases and both clinical and autopsy findings were characteristic of a diptheritic myocarditis. All three fatal cases of Flexner infection were culturally negative at the time of death. The reduction in case-fatality rates in Sonne infections was not as large, and each fatal case (cases 4, 5, and 6) showed evidence of failure on the part of the sulfonamide. A brief discussion of these fatalities is given below:

Case 1.—Seven-week-old colored male admitted with severe dehydration and a history of illness lasting 2½ days. *Shigella paradysenteriae* Flexner was isolated from the stool on admission. This child was placed on sulfapyrazine immediately, and cultures obtained 24 and 36 hours later were negative. The patient,

however, died 36 hours after admission, still severely dehydrated and acidotic. In this particular case parenteral fluid administration was not given and the death was apparently due to this omission.

Case 2.—Three-year-old colored female admitted with severe diarrhea and sore throat, 6 days' duration. The patient was found to have Flexner infection and diphtheria. Both sulfadiazine and diphtheria antitoxin were given in adequate amounts. The stool cultures cleared promptly and membrane in the throat also disappeared. However, the patient died on the tenth hospital day with myocardial failure. Further cultures taken at autopsy were negative for *Shigella* and microscopic examination of the bowel revealed healing ulcerations of the mucosa of the large bowel. In this case death was clearly not due to failure of the sulfonamide.

Case 3.—Twenty-month-old colored female admitted with a history of severe diarrhea. The culture was positive on admission for Flexner type. The patient was treated with sulfamethazine and 3 days later the temperature and clinical findings showed definite improvement. However, at the end of this time the temperature began to rise. Sulfonamide was discontinued as urinary findings indicated definite kidney damage. The patient's fever remained at a high level. Progressive toxicity ensued with oliguria. The patient died on the eighth hospital day. Death was due to toxic nephritis presumably resulting from the sulfonamide used. The colon showed healing ulcerations of the mucosa.

Case 4.—Twenty-two-month-old colored male. Sick less than 12 hours before admission, patient was brought to the hospital with a high fever and convulsions. No diarrhea had been noticed at that time but sulfadiazine therapy was begun at once on the possibility of meningitis. Stool culture on admission showed *S. sonnei* present and a few hours later a profuse watery diarrhea developed. This patient was comatose and did not recover consciousness, dying 40 hours after admission. Sulfonamide was administered in large doses by parenteral methods. There was no evidence of response, either clinical or bacteriological, to this therapy. In this particular case, despite adequate dosage of sulfonamide, a failure resulted. The organism isolated was highly resistant to sulfonamides in in vitro tests.

Case 5.—Ten-month-old white male, admitted after an illness of 3 days. The patient was severely dehydrated and acidotic. *S. sonnei* was isolated and sulfadiazine therapy begun at once. Clinical response was prompt but on the third hospital day the patient developed signs and symptoms of pneumonia and expired 36 hours later. Cultures were still positive for *S. sonnei* at the time of death.

Case 6.—Newborn premature infant, with an *S. sonnei* infection acquired at birth from the mother, who was also positive for the same organism. This child was treated with sulfadiazine and there was a reduction in the number of organisms found in the stool. However, the stools did not become negative, a mild diarrhea persisted, and 23 days after birth the patient died. Autopsy was not obtained, but the clinical diagnosis of cause of death was aspiration pneumonia. The patient at no time was very strong and although the enteric symptoms were not marked it is believed that the *Shigella* infection was definitely a contributory factor to this condition.

COMPLICATIONS

Severe complications as a result of sulfonamide administration were rare, the majority being detected only by routine urinalysis, and these did not interfere with the therapy. All observed complications are tabulated in table 3. Only proven cases of shigellosis with at

TABLE 3.—*Observed complications of sulfonamide therapy*

	Drug		
	Sulfadiazine [1]	Sulfapyrazine [1]	Sulfamethazine [2]
Number of cases	117	101	44
Number with complications	10	6	6
Types of complications: Crystalluria	10	6	5
Types of complications: Hematuria	3	0	3
Types of complications: Renal colic	1	0	0
Types of complications: Nausea	0	1	2
Types of complications: Fever	0	0	3
Types of complications: Rash	1	0	1
Types of complications: Death	0	0	[3]1

[1] Cases of shigellosis with at least 1 posttreatment urinalysis.
[2] 31 cases of shigellosis and 13 miscellaneous cases with at least 1 posttreatment urinalysis.
[3] Toxic nephritis (case 3).

least one posttreatment urinalysis are shown in the sulfadiazine and sulfapyrazine groups. Some non-*Shigella* cases are included under sulfamethazine, since this group was also considered when it was decided to discontinue using this drug. It is believed that all severe and constitutional reactions were seen and recorded but the total for all three drugs must be considered as minimal, since failure to detect a mild complication is not necessarily indicative of its absence. A total of 37 complications was observed and 29 of them were renal in nature. With a single exception all of these renal conplications were encountered during a period when the urine was acid. It is probable that most, if not all, of these could have been prevented if larger quantities of alkali had been given on admission and during treatment. It is obvious that the rule-of-thumb dose of sodium bicarbonate (amounts equal to the dose of sulfonamide) was not sufficient in many cases to render the urine alkaline. Particular attention must be paid to this point in the management of children since acidosis is common in the diarrheas of this age group.

SUMMARY

Three sulfonamide preparations, sulfadiazine, sulfapyrazine, and sulfamethazine, were used in the treatment of 333 hospitalized cases of acute shigellosis. All three were therapeutically active in about the same degree in the treatment of these disorders. These findings were similar to those reported for institutional groups in which the majority of the patients were asymptomatic carriers. Infections with *S. paradysenteriae* Flexner as a rule responded promptly and completely, those with *S. sonnei* were more resistant to therapy. This was shown in both the results of stool culture and the case-fatality rates. Sulfadiazine and sulfapyrazine were relatively nontoxic, particularly when

an alkaline urine was obtained promptly. Either of these drugs is recommended for therapy of shigellosis. Sulfamethazine was active against the *Shigellae* but the number of toxic reactions of a systemic nature were sufficiently large to place this drug in the undesirable class.

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PLAGUE INFECTION REPORTED IN THE UNITED STATES DURING 1944 AND SUMMARY OF HUMAN CASES, 1900–44 [1]

By Brock C. Hampton, *United States Public Health Service*

IN HUMAN BEINGS

One case of plague was reported in the United States during the calendar year 1944. This was a case of primary pneumonic plague, in which the infection was acquired in the laboratory. The patient was a medical officer of the Public Health Service who was engaged in research at the Plague Laboratory in San Francisco. He became ill on May 30 and was admitted to the United States Marine Hospital in San Francisco on June 1. He recovered.[2] Although the pneumonic type of the disease is highly contagious in man, the precautionary measures promptly adopted prevented the occurrence of secondary cases.

The accompanying table summarizes the reported cases of plague and deaths from this cause in the United States since 1900, when the disease was first introduced into this country.

[1] From the Division of Public Health Methods. The data for 1944 are a consolidation of reports received from the Plague Laboratory of the U. S. Public Health Service in San Francisco, Calif., and published currently in the Public Health Reports, supplemented by information furnished by the Office of Plague Suppressive Measures in San Francisco. For a similar report for 1943, and references to reports for prior years since 1900, see Pub. Health Rep., 59: 911–915 (July 14, 1944).

[2] For a clinical history of this case, see J. Am. Med. Assoc., 128: 281–283 (May 26, 1945).

TABLE 1.—*Cases of, and deaths from, plague in the United States*

Year	California		Washington		Louisiana		Florida		Texas		Oregon		Utah		Nevada		Idaho		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
1900	22	22																	22	22
1901	30	26																	30	26
1902	41	41																	41	41
1903	17	17																	17	17
1904	10	8																	10	8
1907	178	87	3	3															181	90
1908	8	5																	8	5
1909	3	1																	3	1
1910	3	1																	3	1
1911	4	1																	4	1
1913	2	2																	2	2
1914	1	0			30	10													31	10
1915	1	1			1	0													2	1
1919	13	13			15	5													28	18
1920	1	1			7	3	10	4	33	19									51	27
1921	3	1			3	3													6	4
1922	2	0																	2	0
1923	1	0																	1	0
1924	41	34																	41	34
1925	1	0																	1	0
1927	1	1																	1	1
1928	3	2																	3	2
1933	1	1																	1	1
1934	1	0									1	1							2	1
1936	3	0											1	0					4	0
1937	1	1													1	0			2	1
1939													1	0					1	0
1940																	1	1	1	1
1941	2	2																	2	2
1942	1	0																	1	0
1943	1	[2] 1																	1	1
1944	[3] 1	0																	1	0
Total	397	269	3	3	56	21	10	4	33	19	1	1	2	0	1	0	1	1	504	318

[1] The annual figures for California for the years 1900–08 were secured from various sources, some of which overlapped and required adjustment; therefore they may not agree with previously published figures. It is believed, however, that they are as nearly accurate as possible. Owing to conditions in the Chinese quarter of San Francisco, it is not to be considered that the records of cases or deaths in the first outbreak are complete, and probably some cases, among the Chinese at least, were not recorded in the second epidemic in 1907. Only the years are listed in which cases or deaths were reported.

[2] Death of case which occurred in 1942.

[3] Case acquired in the laboratory.

IN RODENTS AND ECTOPARASITES

During 1944, as in several prior years, field surveys to collect specimens of rodents and their ectoparasites, in order to determine the location and extent of sylvatic plague infection, were conducted by mobile units of the Public Health Service and of the health departments of several western States. The Public Health Service Plague Laboratory in San Francisco continued to examine the specimens collected by these field units (except those of the California State Department of Health) and to aid in identifying the species of animals and infected parasites. The Plague Laboratory also conducts epidemiologic studies of plague and of other diseases transmitted by ectoparasites.

During 1944, plague infection was reported in five counties in California, two counties in Colorado, two counties in New Mexico, one county in Montana, one county in Oklahoma, and on the Tacoma

(Washington) waterfront. Infection was found in various specimens as follows: In fleas from ground squirrels (*Citellus beecheyi*), prairie dogs (*Cynomys* sp.), cotton rats (*Sigmodon hispidus*), wood rats (*Neotoma albigula*), Norway rats (*Rattus norvegicus*), black rats (*R. rattus*), grasshopper mice (*Onychomys leucogaster*), white-footed mice (*Peromyscus* sp.), and meadow mice (*Microtus townsendii*); in tissue from ground squirrels (*C. beecheyi*), rats (*R. norvegicus*), and meadow mice (*M. townsendii*).

The proved area of plague infection in wild rodents in the western States was extended slightly farther east during the year by the finding of infected fleas collected from wood rats (*Neotoma* sp.) and white-footed mice (*Peromyscus* sp.) 20 miles southwest of Boise City, Cimarron County, Okla. Infection was proved on June 29 by cultures and animal inoculation. This was the first report of plague infection in Oklahoma, and the location is apparently the farthest east in which the infection in ectoparasites or wild rodents has been reported in the United States up to the end of 1944. Cimarron County borders on Union County, N. Mex., where infected fleas from grasshopper mice (*Onychomys leucogaster*) were found in two different localities in May 1944 and June 1943. These localities and Divide County, N. Dak. (1941), were the farthest east in which sylvatic plague infection had previously been found.

During the year, plague infection was reported again on the waterfront of Tacoma, Wash. The first instance of such infection discovered in Tacoma was reported in the autumn of 1942, and was proved, bacteriologically and by animal inoculation, in fleas from rats collected on the waterfront between September 22 and October 10. During the fall of 1942 a heavy infection in rats and their fleas was found in populous areas of the waterfront, but a vigorous control campaign was instituted and no human case occurred. The last positive specimen in this occurrence was found on May 4, 1943. However, after nearly a year and a half, during which time no positive specimens were discovered, infection was reported again on October 16, 1944, in fleas taken on the Tacoma waterfront, and was subsequently proved in additional fleas, and in tissues from rats and mice. The last reported positive specimens found during 1944 were collected on December 23.

Although the origin of plague infection in Tacoma has not been determined, it is possible that the 1944 infection came from the same source as the first plague specimens found in 1942. The original specimens were taken from a heavily rat-infested area where railway cars filled with grain were unloaded. Many of these grain shipments originated in localities of eastern Washington which are known to be foci of sylvatic plague. If this should be the source, it emphasizes the

importance of knowledge regarding endemic rural areas. On the other hand, only a few hundred yards from the heavily infected area are piers at which ships from Hawaiian, Russian, and South American ports dock to load flour and other grain products. A considerable percentage of these vessels were reported to be rat-infested, and it is possible that plague could have been introduced into Tacoma in this manner.

The data summarized in the accompanying table for 1944 and prior years should not be interpreted as presenting a complete delineation of areas in which plague infection has been or is present among wild rodents, or as a quantitative measure of infection. The field surveys are limited by the number of personnel, the areas covered, and the seasonal periods favorable for conducting the field operations. Although these surveys are essentially sampling procedures, they demonstrate the continuance of a wide biologic and geographic distribution of plague infection in western United States, and the findings may serve to give warning if the areas of sylvatic infection approach localities in which susceptible rodent species and human populations are present in sufficient densities to constitute a potential danger. These data also point out endemic rural areas from which the infection may reach ports or inland cities through shipments of grain or other food stuffs, carrying either infected rodents or infected parasites.

With respect to the small number of positive specimens found in 1944 as compared with 1943, Dr. N. E. Wayson, medical officer in charge of the Plague Laboratory in San Francisco, comments that several factors contribute to the difference. Probably the principal factors are: Less intensive control activities in some areas; fewer field units in 1944 than in previous years; and, in an attempt to determine the eastern boundary of plague infection, operations throughout the 1944 season were principally in the Plains States east of the Rocky Mountain States. Other factors suggested are: The fluctuation in the incidence of infection among rodents even in areas previously found to be infected; the length of the season during which the field crews can operate to advantage in rural areas; and the effects of spring rainfall and snowfall on both the field operations and the emergence of young animals.

In the reports presented in the following table, plague infection in animal tissues and ectoparasites was demonstrated in each instance bacteriologically or by inoculation of laboratory animals, including mass inoculation with emulsions of parasites.

TABLE 2.—*Plague infection in rats, wild rodents, and their ectoparasites reported to the Public Health Service during 1944*

State and county	Date [1]	Infection found in—
California:		
Kern County	Sept. 9	A pool of 164 fleas from 35 ground squirrels (*Citellus beecheyi*) taken from 2 to 4 miles east of Lebec.
Do	Sept. 22	A pool of 200 fleas from 31 ground squirrels (*C. beecheyi*) taken 7 miles north of California Institution for Women.
Lassen County	Aug. 8	Tissue from 4 ground squirrels (*C. beecheyi*) taken approximately 5 miles northwest of Milford.
Monterey County	Mar. 27	A pool of 284 fleas from 14 ground squirrels (*C. beecheyi*) taken approximately 17 miles southeast of Monterey.
San Bernardino County	Oct. 10	A pool of 67 fleas from 7 ground squirrels (*C. fisheri*) taken 8 miles west of Big Bear Lake.
San Luis Obispo County	June 22	A pool of 615 fleas from 32 ground squirrels (C. *beecheyi*) taken approximately 10 miles northeast of Santa Maria.
Do	Aug. 23	2 pools of 200 fleas each from 40 ground squirrels (*C. beecheyi*), and tissue from 10 ground squirrels, same species, taken 2 miles east of San Luis Obispo.
Do	Aug. 25	A pool of 200 fleas from 24 ground squirrels (*C. beecheyi*) taken 2 miles east of San Luis Obispo.
Do	Aug. 28	A pool of 400 fleas from 25 ground squirrels (*C. beecheyi*)p taken 4 miles north of Alamo Creek bridge and Highway No. 166.
Colorado:		
Baca County	June 27	A pool of 157 fleas from 55 prairie dogs (*Cynomys* sp.) taken approximately 13 miles northwest of Pritchett.
Bent County	June 20	A pool of 642 fleas from 81 prairie dogs (*Cynomys* sp.) taken approximately 3 miles northwest of Deora.
Montana:		
Big Horn County	July 26	A pool of 50 fleas from 20 prairie dogs (*Cynomys ludovicianus*) taken 20 miles northeast of Hardin.
New Mexico:		
Quay County	May 10	A pool of 13 fleas from 2 cotton rats (*Sigmodon hispidus*) taken 20 miles east of Tucumcari on Highway No. 66, and from the same location a pool of 60 fleas from 2 wood rats (*Neotoma albigula*).
Union County	May 11	A pool of 22 fleas from grasshopper mice (*Onychomys leucogaster*) taken 18 to 23 miles south of Clayton on Highway No. 18.
Oklahoma:		
Cimarron County	June 8	A pool of 58 fleas from 7 wood rats (*Neotoma* sp.), and a pool of 4 fleas from 12 white-footed mice, (*Peromyscus* sp.), taken 20 miles southwest of Boise City.
Washington:		
Pierce County, Tacoma waterfront.	Oct. 18	Plague infection, first reported on Oct. 16, confirmed in 2 flea specimens.
Do	Oct. 23	A pool of 50 fleas from 23 rats (*Rattus norvegicus*).
Do	Oct. 23–28	Spleen from 1 rat and pool of spleens from 5 rats; pool of 400 fleas from 22 rats; and pool of 61 fleas from 46 rats (all *R. norvegicus*).
Do	Nov. 1	2 fleas from 2 rats (*R. rattus*).
Do	Nov. 4	A pool of 119 fleas from 65 rats (*R. norvegicus*).
Do	Nov. 15	A pool of 32 fleas from 6 rats (*R. norvegicus*).
Do	Nov. 25	A pool of 53 fleas from 2 rats (*R. norvegicus*).
Do	Dec. 23	Pools of fleas from rats and mice and tissue from mice as follows: 51 fleas from 4 rats, 81 fleas from 12 rats, 18 fleas from 8 rats, 21 fleas from 3 rats, 9 fleas from 9 rats, 26 fleas from 52 rats (all *R. norvegicus*), 4 fleas from 4 mice (*Microtus townsendii*), 12 fleas from 9 mice (*Peromyscus* sp.), and spleens from 2 mice (*M. townsendii*).

[1] Date on which specimens were collected.

PLAGUE INFECTION REPORTED IN THE TERRITORY OF HAWAII DURING 1944 AND SUMMARY OF HUMAN CASES, 1899–1944 [1]

By BROOK C. HAMPTON, *United States Public Health Service*

IN HUMAN BEINGS

During the calendar year 1944, five fatal cases of plague were reported in the Territory of Hawaii. All of these cases occurred in the Hamakua District on the Island of Hawaii, which has been the

[1] From the Division of Public Health Methods.

center of infection in the Islands since the disease was first reported in that locality in 1910.

The Hamakua District is an agricultural region, the principal crop of which is sugar cane. There are five large sugar plantations in the District. Most of the population resides in small villages and numerous plantation camps. It is reported that, in recent years, more cases in that District have been contracted in the fields than around the houses.[3]

IN RODENTS AND ECTOPARASITES

The accompanying table shows the reported infection in rodents and their ectoparasites during 1944. The information received did not identify the species of fleas or rodents found infected. However, according to a previous study,[3] the principal species of rat trapped in the Hamakua District, both inside and outside of buildings, was *Rattus rattus alexandrinus* (approximately 50 percent), while the principal rat flea recovered from rodents was *Xenopsylla cheopis* (approximately 70 percent).

TABLE 1.—*Plague infection in rodents and ectoparasites reported in the Hawaiian Islands during 1944* [1]

Island and district	Date [2]	Infection found in—
Island of Hawaii:		
Hamakua District	Jan. 6	1 mouse.
Do	Jan. 7	Do.
Do	Jan. 12	Do.
Do	Jan. 12	1 rat.
Do	Jan. 15	Do.
Do	Jan. 19	Do.
Do	Jan. 24	Do.
Do	Jan. 27	Do.
Do	Feb. 2	2 rats.
Do	Feb. 4	1 rat.
Do	Feb. 9	Do.
Do	Feb. 14	1 mouse.
Do	Feb. 17	1 rat.
Do	Feb. 18	4 rats.
Do	Feb. 22	2 rats.
Do	Feb. 23	1 rat.
Do	Feb. 25	Do.
Do	Feb. 28	2 mice.
Do	Feb. 29	1 rat.
Do	Feb. 1-29	Pools of fleas (53) from 176 trapped rodents.
Do	Mar. 1	1 mouse and 1 rat.
Do	Mar. 6	1 rat.
Do	Mar. 7	1 mouse.
Do	Mar. 8	Do.
Do	Mar. 10	Do.
Do	Mar. 17	1 mouse and 1 rat.
Island of Hawaii—Continued.		
Hamakua Dist.—Continued	Mar. 28	1 rat.
Do	Mar. 29	Do.
Do	Mar. 30	3 rats.
Do	Apr. 3	1 mouse.
Do	Apr. 4	1 rat.
Do	Apr. 7	Do.
Do	May 31	Do.
Do	June 28	2 rats.
Do	July 6	1 rat.
Do	July 14	1 mouse.
Do	July 27	1 rat.
Do	Aug. 15	Culture from pool of 8 mice.
Do	Aug. 19	1 rat.
Do	Aug. 22	Do.
Do	Sept. 19	Do.
Do	Oct. 10	Do.
Do	Oct. 25	Do.
Do	Oct. 31	Do.
Do	Nov. 1	Do.
Do	Nov. 3	Do.
Do	Nov. 10	Do.
Do	Nov. 27	Pool of 75 fleas.
Do	Nov. 29	1 rat.
Do	Dec. 12	Pool of rats.
Do	Dec. 28	Pool of 5 mice.
Maui Island:		
District 13A	Dec. 19	1 rat.

[1] Where not otherwise stated, infection was found individually in the number of specimens given.
[2] Date on which specimens were collected.

[3] Eskey, C. R.: Epidemiological study of plague in the Hawaiian Islands. Pub. Health Bull. No. 213 (October 1934).

SUMMARY OF HUMAN CASES, 1899–1944

Two ships from Hong Kong via Japan arrived at Honolulu during the summer of 1899 (June and July) with histories of plague on board en route. A death suspected to be from plague had occurred on one of the vessels 3 days before arrival, and another death regarded as due to plague occurred while the ship was in port. Plague had been present in Hong Kong for several years and was reported epidemic in certain parts of Japan in 1899. The first case in Honolulu was recognized by a Chinese physician, who stated that he first began to see cases with symptoms of plague early in November of 1899. On December 10 a death occurred in which the patient exhibited definite symptoms of plague, and a second fatal case with similar symptoms occurred the following day. The diagnosis was confirmed by postmortem examination, and on December 12 the Territorial Board of Health officially declared the presence of plague in Honolulu.[3]

Ports on the Islands of Hawaii, Maui, and Kauai reported the presence of plague within a short time. The disease was reported in Kahului, Maui, in January 1900; at Hilo, Hawaii, in February 1900; and at the less closely associated port Waimea, Kauai, in May 1901. (See footnote 2.)

During the period 1899–1944, 414 cases of plague were reported in the Islands. On the basis of reported cases, the fatality rate from plague in the Hawaiian Islands has been high. During the period 1899–1933, 397 cases, with 360 deaths, were reported (see footnote 2); while during the years 1934–44 all of the 17 reported cases were fatal.

The accompanying table summarizes the reports of human cases of plague in the Hawaiian Islands from 1899 to 1944.

[3] Reports and papers on bubonic plague, 1898–1901, submitted by the medical officer of the local government board, London, 1902, pp. 384–385.

TABLE 2.—*Reported human cases of plague in the Hawaiian Islands, 1899–1944*

Year	Oahu		Kauai	Maui	Island of Hawaii			Total
	Honolulu	Other			Hilo sector	North Hilo district	Hamakua district	
1899	17							17
1900	54			9	5			68
1901	17		4					21
1902	27	3	9					39
1903	18				5			23
1904	8				5			13
1905	16	3			4			23
1906	18		2		2			22
1907	9	35			3			47
1908	1				2			3
1909					10			10
1910	2				6		3	11
1911							5	5
1912					1		7	8
1913							4	4
1914							4	4
1915							4	4
1916								
1917							5	5
1918						2		2
1919							7	7
1920							4	4
1921							4	4
1922							12	12
1923							1[1]	1
1924							1	1
1925							2	2
1926							7	7
1927							7	7
1928							8	8
1929							5	5
1930				1				1
1931				1				1
1932				4			2	6
1933							2	2
1934							2	2
1935							1	1
1936								
1937								
1938				1				1
1939							1	1
1940								
1941								
1942								
1943							7	7
1944							5	5
Total	187	41	15	16	43	2	110	414

[1] The figures for the years 1899–1933 are taken from Public Health Bulletin 213; those for subsequent years are from reports received by the Public Health Service from the Territorial Board of Health.

LOCAL HEALTH UNITS FOR THE NATION[1]

Reviewed by GEORGE T. PALMER, *Senior Sanitarian (R), United States Public Health Service*

A concrete plan, with details given, to extend public health protection to uncovered areas of the country is the substance of this report of 333 pages from the Subcommittee on Local Health Units, Committee on Administrative Practice of the American Public Health Association. The book is edited by Dr. Haven Emerson, Chairman of the Subcommittee, with the collaboration of Martha Luginbuhl, and is published by the Commonwealth Fund of New York City.

[1] Local Health Units for the Nation, by Emerson, Haven, M. D., and Luginbuhl, Martha. The Commonwealth Fund, 41 East Fifty-seventh St., New York 22, N. Y.

The gist of the report is this: Only two-thirds of our people today are receiving full-time health protection. Forty million people are not. The reason they are not is partly the result of local economic deficiencies and is caused partly by our continued adherence to what Emerson calls our "horse and buggy political boundary lines." That is, health departments are set up to fit within existing boundary lines regardless of size. The health administrative boundary lines ought to be revamped to fit an area large enough to support a full-time health department if we expect to have sound and efficient health protection.

Many areas have no official local health organization and depend on voluntary and State health agencies for such limited services as are provided. Other areas, and there are 18,000 of them—counties, cities, towns, villages, and districts—have some form of official health activity on a full-time or part-time basis. There may be a health department in a city but none in the surrounding suburban area. There may be health departments in two or three small cities in a county and also a county health department exclusive of these cities. One county might have a health department but there will be none in the adjacent county. One town will have a health department of one, two, or three part-time people.

The point made is that the small area of 10,000, 15,000, or 25,000 people cannot reasonably support an effective health department with a trained full-time health officer. Furthermore, it is inefficient to limit a trained man to a small area; his directing capacity ought to be used to better advantage. To keep within its budget the small area tends to economize with half-way measures, with a local physician, who has no public health training and gives only part of his time to health officer duties.

If we expect competent public health service over the country with trained full-time staff, the solution, according to the report, is not more health departments but primarily extension of the boundaries of the local health jursidiction to cover a population of at least 50,000 people.

The goal is complete coverage of the country with at least a basic minimum full-time service; units of public health jurisdiction of populations large enough (50,000 or more) to support and justify staffs of full-time, professionally trained persons; a minimum budget of at least $1 per capita.

This can be done with only about 1,200 units of local health jurisdiction for the entire continental United States, which is just about the number of full-time units which now exist with only part of the country covered. In practice this means consolidation and combination of local areas into the above number of local health jurisdictions.

The uncovered suburban area of a city would join with the city for health administrative purposes; or the smaller cities in a county would join with the rural area into a single county health department; or one small county would join with one or more adjacent counties into a single health jurisdictional unit. The population of each resulting single health unit would in every instance be not less than 50,000.

There is nothing radical in this proposal. Many such consolidations exist today in the field of education, public roads, as well as public health. What is new in the proposal is the call for a concerted public-supported effort to extend the benefits of these administrative principles to the country at large.

The acceptance of this plan of course rests with local communities and the States. Although some States have no laws to permit or encourage such governmental consolidations, Emerson points out that in no instance is it forbidden,.

Those to whom the subcommittee addresses its appeal for support in this movement for wider health protection are the farmer and labor groups, the professional organizations—medical, dental and nursing—the official and voluntary health agencies, and the State universities. It is among these groups, who are most intimately and vitally concerned in a better quality of living both in the small and the large community, that a plan of readjustment to modern realities, common sense, and efficient government for better health protection should find its major supporters.

A prodigious amount of labor has gone into this report, for the committee has implemented its ideas with a method of approach to the practical realization of the plan. This project is the result of several years of inquiry and effort. The report shows how each individual State can bring about this objective. The specific areas to be consolidated are indicated in tables and maps, and this grouping was attained only after prolonged correspondence back and forth with State health officers, who from their more intimate knowledge of the area, suggested practical modifications to avoid mountain and water barriers, and to take advantage of lines of transportation.

But even further, Emerson and Luginbuhl have plotted the existing personnel of health departments in each little area, the expenditures for health, the spendable income of the area, the number of hospital beds, the number of practicing physicians, and then they have shown for each newly revised health jurisdiction what is further needed or is unnecessary in terms of specific personnel and budget. It is a frank appraisal and not wholly a plea for more personnel, as might have been anticipated.

It is stated that the 1,200 full-time health officers and the thousand other full-time medical administrators in special fields, tuberculosis, venereal disease, child hygiene, etc., now provided for a part of the

country, are sufficient to cover the entire country through reorganization of health district boundaries. The 4,300 part-time health officers now existing would not be needed. The 4,900 sanitarians now provided could be reduced to 3,900. In some professional categories, however, many more workers are needed: Twice as many public health nurses, 4 times the present number of public health engineers, 3 times the present number of laboratory workers, 11 times the dental hygienists, nearly 13 times the number of health educators, a few more full-time dentists, 4 times the number of part-time dentists, and a 40-percent increase in part-time medical clinicians.

For two-thirds of the country today we are spending 77 million dollars for local health departments. The committee sees 127 million as the total needed which would supplement what is now missing and extend the work over the now uncovered areas. From 61 cents per capita the collective local health bill would rise to 97 cents per capita.

It is recognized that this is an average figure, that some communities would need to spend more than others, depending on the magnitude of the local problems. It is also made clear that the dollar per capita is a basic minimum, and that some areas which can afford it will quite naturally want to provide more than a basic minimum. But the achievement generally of even the basic minimum of $1 per capita will represent a long step ahead.

In working out the cost figures Emerson developed a reasonable planning formula for the number of different kinds of personnel in a health department. Thus, he specifies for each area of 50,000 population: A full-time health officer, 10 nurses, including 1 supervisor, 2 sanitarians, at least 1 of whom is of professional grade such as a sanitary engineer, and 3 clerks. Additional personnel, including part-time medical and dental clinicians, laboratory people, statistical supervisor, health educator, veterinarian, and dental hygienist, would be added as needed, depending upon the particular problems encountered locally. The size of the community and the amount of service available from the State health department would also be a factor in determining the number and kind of additional personnel. But the basic pattern as to nurses, sanitarians, and clerks would still hold in general.

It would be like selecting a new suit of clothes; a garment is chosen from stock and then some alterations usually are made to fit the particular customer and to meet the personal wishes of the individual.

Everyone who has a professional or a civic interest in public health should read the first 24 pages of this report. The remaining 300 pages are devoted mainly to the special problems of the individual States and reader interest in these latter pages will be focused on the home State.

In these State descriptions is to be found a gold mine of pertinent and detailed information—a picture in terms of full-time and part-

time personnel and the cost, and a veritable blueprint of a plan designed to increase efficiency and to extend the benefits of public health protection more widely.

Whether or not one agrees, in its local application, with what Emerson and his committee have here set forth, this is a challenging document that deserves serious consideration. It is a topic that should claim the attention of study groups in all civic organizations.

Has America reached the stage in its development where for the good of the greater number it can subordinate its individualism insofar as each small area running its own special health service is concerned?

The question to be frankly faced by John and Mary Citizen throughout the length and breadth of the land is one of relative values. Local self-government is precious. Sound and efficient health protection is even more precious as a national asset. For the greater good are we willing to sacrifice a little of our extreme local autonomy and join with our neighbors across the boundary line to do a better job of disease prevention and health protection?

INCIDENCE OF HOSPITALIZATION, SEPTEMBER 1945

Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country mostly in large cities.

Item	September	
	1944	1945
1. Number of plans supplying data	75	79
2. Number of persons eligible for hospital care	14,876,616	18,580,840
3. Number of persons admitted for hospital care	124,720	157,675
4. Incidence per 1,000 persons, annual rate, during current month (daily rate × 365)	102.2	103.3
5. Incidence per 1,000 persons, annual rate for the 12 months ended Sept. 30, 1945	104.2	105.5
6. Number of plans reporting on hospital days	19	29
7. Days of hospital care per case discharged during month [1]	6.80	7.86

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

DEATHS DURING WEEK ENDED OCTOBER 20, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 20, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	9,426	9,021
Average for 3 prior years	8,754	
Total deaths, first 42 weeks of year	376,048	377,220
Deaths under 1 year of age	621	652
Average for 3 prior years	621	
Deaths under 1 year of age, first 42 weeks of year	25,512	26,040
Data from industrial insurance companies:		
Policies in force	67,298,289	66,811,073
Number of death claims	12,611	12,709
Death claims per 1,000 policies in force, annual rate	9.8	9.9
Death claims per 1,000 policies, first 42 weeks of year, annual rate	10.1	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring.

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED OCTOBER 27, 1945

Summary

Following an interruption last week in the downward trend, the incidence of poliomyelitis again declined. A total of 489 cases was reported, as compared with 617 last week, 549 for the next earlier week, 581 for the corresponding week last year, and a 5-year (1940–44) median of 363. Decreases were reported in all sections of the country except the East South Central and Mountain areas, but increases of from 6 to 9 cases occurred in 4 States—Ohio (23 to 29), Illinois (42 to 51), Iowa (18 to 25), and Tennessee (17 to 25). A total of 11,554 cases has been reported in the 32-week period since March 17, the week of lowest incidence this year, as compared with 17,174 and 10,818, respectively, for the corresponding periods of 1944 and 1943, and a 5-year median of 8,076. The total for the year to date is 11,952, as compared with 17,437 and 11,120 for the same periods of 1944 and 1943, and a 5-year median of 8,383.

A total of 97 cases of meningococcus meningitis was reported, as compared with 73 last week, 152 and 198 for the corresponding weeks of 1944 and 1943, respectively, and a 5-year median of 68. States reporting the largest numbers are New York (11), Ohio (10), Illinois and California (8 each), Missouri (7), Texas (6), and Massachusetts (5). Since the week ended September 1, the week of lowest incidence this year (61 cases), a total of 686 cases has been reported, as compared with 1,110 and 1,531, respectively, for the same periods of the epidemic years of 1944 and 1943.

The total of 832 cases of diphtheria reported for the week, as compared with a 5-year median of 537 cases, is more than reported for a corresponding week since 1939. Nearly all of the excess incidence for the current week as compared with the corresponding week last year is in the East Central and South Atlantic areas.

Of the total of 2,371 cases of influenza reported, as compared with 1,549 for the corresponding week last year and 1,339 for the 5-year median, 1,926 were reported in Virginia, South Carolina, and Texas. The same States reported 1,290 of the 1,549 cases reported for the corresponding week last year.

A total of 8,814 deaths was recorded in 93 large cities of the United States, as compared with 9,431 last week, 9,004 for the corresponding week last year, and a 3-year (1942–44) average of 8,878. The total to date is 384,867, as compared with 386,224 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended October 27, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria: Week ended— Oct. 27, 1945	Diphtheria: Week ended— Oct. 28, 1944	Diphtheria: Median 1940–44	Influenza: Week ended— Oct. 27, 1945	Influenza: Week ended— Oct. 28, 1944	Influenza: Median 1940–44	Measles: Week ended— Oct. 27, 1945	Measles: Week ended— Oct. 28, 1944	Measles: Median 1940–44	Meningitis, meningococcus: Week ended— Oct. 27, 1945	Meningitis, meningococcus: Week ended— Oct. 28, 1944	Meningitis, meningococcus: Median 1940–44
NEW ENGLAND												
Maine	0	0	0	---	1	---	2	1	46	1	1	2
New Hampshire	0	0	0	---	---	---	0	11	1	0	0	0
Vermont	0	0	0	---	---	---	0	0	6	0	0	0
Massachusetts	8	3	3	---	---	---	210	94	159	5	5	4
Rhode Island	0	0	0	9	12	---	0	2	9	0	1	1
Connecticut	1	0	0	---	---	---	9	1	6	2	4	1
MIDDLE ATLANTIC												
New York	21	11	16	[1] 4	[1] 4	[1] 4	37	31	83	11	25	17
New Jersey	6	10	8	7	2	8	17	12	40	3	4	4
Pennsylvania	8	14	13	2	2	1	198	36	112	8	9	7
EAST NORTH CENTRAL												
Ohio	58	4	15	4	5	6	8	6	23	10	10	2
Indiana	25	18	12	18	8	12	5	4	16	1	4	2
Illinois	10	2	12	2	7	7	120	13	23	8	15	2
Michigan [2]	13	21	9	1	1	---	107	8	39	3	8	2
Wisconsin	4	1	1	16	9	18	21	15	53	2	3	1
WEST NORTH CENTRAL												
Minnesota	9	13	3	---	1	1	2	1	4	4	1	1
Iowa	3	2	2	---	---	---	3	3	14	0	0	0
Missouri	5	4	6	---	5	5	3	1	5	7	5	0
North Dakota	4	1	1	---	---	---	2	2	2	0	0	0
South Dakota	0	0	1	---	---	---	0	4	2	1	2	0
Nebraska	3	3	3	---	1	1	3	6	6	0	1	0
Kansas	4	4	4	2	---	---	15	10	10	2	0	0
SOUTH ATLANTIC												
Delaware	1	1	0	---	---	---	0	0	1	0	0	0
Maryland [2]	20	6	5	2	2	2	3	3	5	0	3	3
District of Columbia	0	0	0	1	2	1	3	2	2	1	2	1
Virginia	39	9	27	192	154	154	19	3	29	0	8	4
West Virginia	17	0	4	---	8	7	0	3	3	0	1	0
North Carolina	108	27	59	---	6	3	3	10	10	1	4	2
South Carolina	36	11	27	558	211	201	28	6	6	0	2	1
Georgia	51	30	30	29	19	19	4	3	3	2	2	1
Florida	9	13	13	1	2	2	5	1	2	0	1	1
EAST SOUTH CENTRAL												
Kentucky	24	6	11	9	---	---	41	4	6	1	1	2
Tennessee	53	14	15	22	15	15	2	5	13	1	1	3
Alabama	39	54	41	79	27	27	2	3	3	5	5	2
Mississippi [2]	42	29	14	---	---	---	---	---	---	0	2	1
WEST SOUTH CENTRAL												
Arkansas	26	21	14	57	19	28	4	0	2	3	0	0
Louisiana	32	41	5	10	---	2	3	4	1	2	1	0
Oklahoma	9	6	11	40	15	20	4	9	6	0	2	0
Texas	78	86	54	1,176	925	548	34	34	17	6	4	0
MOUNTAIN												
Montana	4	0	2	1	4	---	17	2	7	0	0	0
Idaho	1	0	0	5	2	2	60	5	5	0	1	0
Wyoming	0	4	1	---	---	2	1	0	3	0	0	0
Colorado	8	4	9	38	8	15	66	5	11	1	0	0
New Mexico	1	2	1	3	---	---	2	1	6	1	2	0
Arizona	1	1	8	57	44	65	0	2	14	0	0	0
Utah [2]	2	0	0	---	2	1	9	4	4	0	0	0
Nevada	0	0	0	---	---	---	0	0	0	0	0	0
PACIFIC												
Washington	6	19	7	---	---	---	128	28	25	2	2	1
Oregon	6	7	6	3	8	9	15	35	23	0	1	1
California	42	35	30	23	18	28	191	152	73	8	9	5
Total	882	587	537	2,371	1,549	1,339	1,406	585	1,435	97	152	68
43 weeks	13,338	10,257	11,789	82,972	347,567	174,921	108,793	595,989	551026	7,015	14,481	2,911

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended October 27, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Oct. 27, 1945	Oct. 28, 1944		Oct. 27, 1945	Oct. 28, 1944		Oct. 27, 1945	Oct. 28, 1944		Oct. 27, 1945	Oct. 28, 1944	
NEW ENGLAND												
Maine	2	0	0	30	34	14	0	0	0	4	1	1
New Hampshire	1	0	0	0	3	8	0	0	0	0	0	0
Vermont	2	0	1	7	9	9	0	0	0	0	0	0
Massachusetts	21	21	7	102	131	121	0	0	0	0	5	4
Rhode Island	0	0	0	3	8	4	0	0	0	0	0	0
Connecticut	8	8	6	20	26	21	0	0	0	2	0	1
MIDDLE ATLANTIC												
New York	48	182	28	164	173	168	0	0	0	10	8	7
New Jersey	26	30	11	41	38	51	0	0	0	4	5	1
Pennsylvania	22	36	6	144	140	115	0	0	0	6	11	7
EAST NORTH CENTRAL												
Ohio	29	25	17	217	204	184	0	0	0	9	0	4
Indiana	5	8	5	52	41	51	0	0	0	2	0	0
Illinois	51	27	27	138	153	153	0	1	1	3	3	7
Michigan [2]	5	19	17	112	97	117	0	0	0	0	1	2
Wisconsin	45	5	5	60	60	104	0	0	0	0	1	1
WEST NORTH CENTRAL												
Minnesota	13	24	13	19	46	53	0	0	0	1	0	0
Iowa	25	18	4	41	38	54	0	0	0	0	0	0
Missouri	14	12	2	51	30	34	2	0	0	3	1	2
North Dakota	0	0	1	17	5	6	1	0	0	2	0	0
South Dakota	0	0	1	4	17	20	0	0	0	0	1	1
Nebraska	2	4	4	13	24	22	0	0	0	0	0	0
Kansas	7	4	11	66	74	59	0	0	0	0	2	1
SOUTH ATLANTIC												
Delaware	3	8	0	4	0	3	0	0	0	0	1	1
Maryland [2]	0	17	1	40	58	82	0	0	0	2	1	3
District of Columbia	3	6	2	13	14	14	0	0	0	3	0	0
Virginia	9	25	6	137	80	52	0	0	0	8	3	9
West Virginia	1	8	3	102	78	51	0	0	0	2	1	1
North Carolina	4	21	2	114	52	113	0	0	0	1	2	2
South Carolina	2	4	2	10	13	18	0	0	0	1	0	4
Georgia	2	1	1	36	30	38	0	0	0	4	7	7
Florida	6	4	2	5	13	8	0	0	0	0	4	3
EAST SOUTH CENTRAL												
Kentucky	4	14	6	49	26	56	0	0	0	5	5	5
Tennessee	25	4	4	41	94	81	0	0	0	2	2	6
Alabama	3	4	4	22	36	36	0	0	0	4	2	5
Mississippi [2]	4	2	2	84	23	14	1	0	0	5	0	8
WEST SOUTH CENTRAL												
Arkansas	0	0	2	13	20	7	1	0	0	2	3	5
Louisiana	9	4	1	33	15	8	0	0	0	1	9	6
Oklahoma	0	1	1	25	20	20	0	0	0	0	0	1
Texas	17	7	7	94	75	41	0	0	0	8	10	12
MOUNTAIN												
Montana	5	0	0	12	20	18	0	1	0	4	1	0
Idaho	2	0	0	6	82	13	0	3	0	0	2	0
Wyoming	1	0	0	1	3	3	0	0	0	0	0	0
Colorado	7	1	2	19	46	21	0	2	0	2	2	2
New Mexico	3	0	0	14	7	6	0	0	0	1	3	2
Arizona	0	0	0	11	10	8	0	0	0	0	3	1
Utah [2]	6	0	3	5	3	8	0	0	0	2	0	0
Nevada	0	0	0	0	3	1	0	0	0	0	0	0
PACIFIC												
Washington	6	9	9	39	38	28	0	0	0	0	5	2
Oregon	5	3	3	0	36	13	1	0	0	0	2	2
California	36	15	15	214	166	103	0	0	0	2	2	4
Total	489	581	368	2,894	2,412	2,284	6	7	9	105	108	135
43 weeks	11,952	17,437	8,383	148,645	160,516	118,474	301	336	688	4,271	4,786	6,001

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: New York 1; New Jersey 1; Illinois 1; North Dakota 1; Virginia 1; South Carolina 1; Georgia 1; Tennessee 1.

Telegraphic morbidity reports from State health officers for the week ended October 27, 1945, and comparison with corresponding week of 1944 and 5-year median

Division and State	Whooping cough: Week ended— Oct. 27, 1945	Whooping cough: Week ended— Oct. 28, 1944	Whooping cough: Median 1940–44	Week ended October 27, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	28	7	9	0	0	0	0	0	0	0	1
New Hampshire	2	3	3	0	0	0	0	0	0	0	0
Vermont	7	16	17	0	0	0	0	0	0	0	0
Massachusetts	128	43	134	0	5	0	0	0	0	0	2
Rhode Island	6	2	4	1	3	0	0	0	0	0	0
Connecticut	27	52	52	0	5	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	243	199	387	4	23	0	0	0	0	0	6
New Jersey	164	79	131	0	0	0	0	0	0	0	2
Pennsylvania	209	123	219	1	1	0	1	0	0	0	2
EAST NORTH CENTRAL											
Ohio	164	77	152	1	1	1	0	0	0	0	1
Indiana	43	11	16	1	0	1	0	0	0	0	0
Illinois	96	91	171	6	0	0	1	0	1	0	14
Michigan [3]	104	50	154	5	1	1	0	0	0	0	9
Wisconsin	50	77	168	0	0	0	0	0	0	0	5
WEST NORTH CENTRAL											
Minnesota	20	53	53	2	0	0	0	0	0	0	1
Iowa	3	2	16	0	0	0	0	0	0	0	14
Missouri	5	25	22	0	0	1	1	0	0	0	2
North Dakota	1	6	8	0	0	0	0	0	0	0	0
South Dakota	1	20	2	0	0	0	0	1	0	0	3
Nebraska	0	9	9	0	0	0	0	0	0	0	0
Kansas	17	18	35	0	0	0	0	0	0	0	5
SOUTH ATLANTIC											
Delaware	1	5	4	0	0	0	0	0	0	0	0
Maryland [3]	50	81	81	0	0	2	0	0	0	0	0
District of Columbia	11	6	10	1	0	0	0	0	0	0	0
Virginia	25	24	35	0	0	66	0	0	0	0	0
West Virginia	7	13	22	0	0	0	0	0	0	0	0
North Carolina	64	50	61	1	0	0	0	0	0	3	1
South Carolina	79	27	27	3	26	0	0	0	0	4	0
Georgia	27	6	9	0	4	0	0	0	0	22	2
Florida	6	3	6	1	0	0	0	0	0	7	0
EAST SOUTH CENTRAL											
Kentucky	45	12	64	0	0	2	0	0	1	0	0
Tennessee	15	17	27	0	0	1	0	0	0	4	0
Alabama	21	20	26	5	0	0	0	0	0	14	2
Mississippi [3]	-------	-------	-------	0	0	0	0	0	0	5	0
WEST SOUTH CENTRAL											
Arkansas	3	16	16	0	16	0	0	0	0	0	0
Louisiana	2	0	4	2	0	0	0	0	0	12	1
Oklahoma	8	2	5	0	0	0	0	0	0	0	2
Texas	99	127	72	8	261	11	0	0	2	18	11
MOUNTAIN											
Montana	7	25	23	0	0	0	0	0	1	0	2
Idaho	6	15	8	0	0	0	0	0	0	0	1
Wyoming	2	5	5	0	0	0	0	0	0	0	0
Colorado	15	2	27	1	1	0	2	0	0	0	1
New Mexico	27	5	6	1	5	2	1	0	0	0	0
Arizona	11	7	7	0	1	6	0	0	0	0	0
Utah [3]	12	15	15	0	0	0	0	0	0	0	2
Nevada	0	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	38	6	56	0	0	0	0	0	0	0	2
Oregon	8	6	10	0	0	0	0	0	0	0	1
California	116	87	155	4	7	0	4	0	0	1	5
Total	2,023	1,545	2,597	48	360	94	10	1	5	90	101
Same week, 1944	1,545	-------	-------	40	624	138	12	4	7	161	47
Average, 1942–44	2,106	-------	-------	36	357	119	11	[4] 4	6	[4] 109	-----
43 weeks: 1945	104,672	-------	-------	1.618	21,645	9,547	552	451	626	4,155	3,970
1944	79,434	-------	-------	1.524	19,750	7,687	564	444	471	4,292	3,333
Average, 1942–44	128,663	-------	[4] 149,727	1.445	14,845	6,759	546	[4] 444	635	[4] 3,014	-----

[3] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.

Leprosy: Texas, 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 20, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	1	0	0	0	1	0	4	0	0	7
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	1	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	1	4	10	24	17	0	1	31
Fall River	0	0	------	0	1	0	0	0	10	0	0	1
Springfield	0	0	------	0	0	1	1	0	1	0	0	1
Worcester	0	0	------	0	12	0	8	0	6	0	0	10
Rhode Island:												
Providence	1	0	------	0	0	0	5	0	4	0	0	14
Connecticut:												
Bridgeport	0	0	------	0	1	0	2	0	0	0	0	0
Hartford	0	0	------	0	0	0	2	1	3	0	0	12
New Haven	0	0	------	0	0	0	1	0	1	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	2	0	------	0	1	0	5	4	9	0	0	18
New York	9	2	2	0	16	6	46	27	54	0	4	96
Rochester	0	0	------	1	0	1	3	4	4	0	1	7
Syracuse	0	0	------	1	2	0	2	0	10	0	0	18
New Jersey:												
Camden	4	0	------	0	0	0	2	0	0	0	0	7
Newark	0	0	2	0	1	1	3	5	2	0	0	30
Trenton	0	0	1	0	0	0	1	1	0	0	0	2
Pennsylvania:												
Philadelphia	8	0	------	0	9	1	16	9	37	0	1	89
Pittsburgh	2	0	------	0	0	1	2	14	17	0	1	14
Reading	0	0	------	0	2	0	0	0	2	0	0	3
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	------	0	1	1	5	3	14	0	0	9
Cleveland	0	0	4	0	0	2	4	6	20	0	0	43
Columbus	3	0	1	1	1	0	0	0	18	0	0	3
Indiana:												
Fort Wayne	0	0	------	0	0	0	3	0	0	0	0	0
Indianapolis	0	0	------	0	2	0	10	1	10	0	0	14
South Bend	0	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	1	0	0	0	0	0
Illinois:												
Chicago	0	0	4	2	66	8	14	8	42	0	1	56
Springfield	0	0	------	0	0	0	1	0	0	0	0	5
Michigan:												
Detroit	5	1	------	0	15	2	7	1	36	0	0	44
Flint	0	0	------	0	16	0	1	0	8	0	0	0
Grand Rapids	0	0	------	0	5	1	1	1	8	0	0	0
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	1	4	0	0	0
Milwaukee	0	0	1	1	2	0	4	9	11	0	0	9
Racine	0	0	------	0	0	0	1	0	2	0	0	0
Superior	0	0	------	0	0	0	0	0	0	0	0	0
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	1	0	5	0	0	0
Minneapolis	1	0	------	0	5	0	5	2	7	0	1	8
Missouri:												
Kansas City	1	0	------	0	3	0	6	0	9	0	0	1
St. Joseph	0	0	------	0	0	0	0	0	0	0	0	0
St. Louis	0	2	------	0	0	2	8	15	15	0	0	1

See footnotes at end of table.

City reports for week ended October 20, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0	------	0	0	0	1	0	2	0	0	0
Nebraska:												
Omaha	2	0	------	0	0	0	6	6	8	0	0	3
Kansas:												
Topeka	0	0	------	0	0	0	0	0	1	0	0	0
Wichita	1	0	------	0	0	0	0	1	2	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	2	0	------	0	0	0	1	0	0	0	0	3
Maryland:												
Baltimore	9	0	2	1	0	0	8	3	19	0	0	38
Cumberland	0	0	------	0	0	0	0	0	0	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	1	0	1	0	2	1	6	4	8	0	1	3
Virginia:												
Lynchburg	0	0	------	0	0	0	0	0	5	0	0	8
Richmond	1	0	------	0	0	0	4	5	8	0	1	0
Roanoke	1	0	------	0	0	0	0	0	0	0	0	0
West Virginia:												
Wheeling	0	0	------	0	0	0	0	0	0	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	0	1	0	0	0	3
Wilmington	1	0	------	0	0	0	1	0	3	0	0	1
Winston-Salem	0	0	------	0	0	0	1	0	4	0	0	6
South Carolina:												
Charleston	1	0	11	0	0	0	0	0	0	0	0	0
Georgia:												
Atlanta	0	0	------	0	0	0	1	0	5	0	0	0
Brunswick	0	0	------	0	0	0	0	0	2	0	0	0
Savannah	0	0	------	0	0	0	2	0	3	0	0	0
Florida:												
Tampa	0	0	------	0	0	0	1	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	1	0	1	1	11	4	7	0	0	8
Nashville	0	0	------	1	0	1	3	1	1	0	0	0
Alabama:												
Birmingham	2	0	1	0	0	0	3	2	2	0	1	0
Mobile	1	0	------	0	0	0	1	0	0	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	0	0	0	0	3	0	0	0
Louisiana:												
New Orleans	4	0	1	1	1	1	6	7	7	0	0	0
Shreveport	2	0	------	0	0	0	2	4	3	0	0	0
Texas:												
Dallas	5	0	------	0	0	0	3	0	13	0	0	0
Galveston	0	0	------	0	0	0	0	0	0	0	0	0
Houston	2	0	------	0	0	2	5	2	8	0	0	0
San Antonio	1	0	------	1	0	0	2	0	3	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	1	0	0	0	0	0
Great Falls	0	0	------	0	0	0	1	0	1	0	0	0
Helena	0	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	0	------	0	3	0	1	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	0	0	0	0	0	0	0
Colorado:												
Denver	2	0	3	0	3	0	7	0	4	0	0	7
Pueblo	1	0	------	0	0	0	0	0	1	0	0	2
Utah:												
Salt Lake City	0	0	------	0	0	0	1	0	3	0	0	1

City reports for week ending October 20, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0	------	0	0	0	4	0	0	0	0	0
Spokane	2	0	------	0	1	2	2	1	0	0	0	3
Tacoma	1	0	------	0	23	0	0	2	1	0	0	0
California:												
Los Angeles	13	0	6	0	9	0	3	9	27	0	1	14
Sacramento	0	1	------	0	4	0	1	2	0	0	0	5
San Francisco	2	0	------	0	58	0	5	3	11	0	0	5
Total	92	6	42	10	267	34	276	193	541	0	14	663
Corresponding week, 1944	98	------	65	16	148	------	341	------	524	0	25	382
Average, 1940–44	81	------	59	[1] 19	[2] 310	------	[1] 314	------	512	0	25	859

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York, 2; Chicago, 1; Baltimore, 1; Los Angeles, 1.
Dysentery, bacillary.—Cases: Providence, 1; New Haven, 1; New York, 11; Columbus, 1; Chicago, 1; Detroit 4; Charleston, S. C., 2; Atlanta, 1; Nashville, 1; Los Angeles, 1.
Dysentery, unspecified.—Cases: Cincinnati, 13; Richmond, 1; San Antonio, 4
Typhus fever, endemic.—Cases: Kansas City, 1; Charleston, S. C., 1, Atlanta, 6; Savannah, 2; Tampa, 2; Nashville, 2; Birmingham, 4; New Orleans, 2; Shreveport, 3; Dallas, 1; Houston, 2; San Antonio, 2; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,058,500)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	2.6	0.0	39	13.1	78.4	65.3	123	0.0	2.6	212
Middle Atlantic	9.3	0.9	2.3	0.9	14	4.6	37.0	29.6	62	0.0	3.2	131
East North Central	6.1	0.6	6.1	2.4	66	5.5	31.6	18.2	99	0.0	0.6	111
West North Central	11.1	4.5	0.0	0.0	18	4.5	60.1	53.4	109	0.0	2.2	20
South Atlantic	26.8	0.0	23.4	1.7	3	1.7	41.9	21.8	95	0.0	3.3	100
East South Central	17.7	0.0	11.8	5.9	6	11.8	106.2	41.3	59	0.0	5.9	47
West South Central	43.0	0.0	2.9	5.7	3	8.6	51.7	37.3	92	0.0	0.0	3
Mountain	23.8	0.0	23.8	0.0	48	0.0	87.4	0.0	71	0.0	0.0	79
Pacific	23.5	1.6	9.5	0.0	150	3.2	23.7	26.9	62	0.0	1.6	48
Total	14.1	0.9	6.5	1.5	41	5.2	42.4	29.6	88	0.0	2.2	102

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 6, 1945.—During the week ended October 6, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		1		30	61	21	20	37	24	194
Diphtheria		1	5	30	6	6	1	1		50
Dysentery:										
Amebic					1					1
Bacillary				19		2				21
German measles				22	7			6	2	37
Influenza		2			13	1				16
Measles		2	1	47	90		3	3	131	277
Meningitis, meningococcus				2	3					5
Mumps				44	22	9	10	19	19	123
Poliomyelitis		4		2	[1]11			1	2	[1]20
Scarlet fever		3	40	92	34	11	5	13	16	214
Tuberculosis (all forms)			6	149	43	25	13	28	23	287
Typhoid and paratyphoid fever		1		24	5	1	1			32
Venereal diseases:										
Gonorrhea	2	13	19	182	210	51	31	37	93	638
Syphilis		6	1	133	86	11	3	17	38	295
Whooping cough		3		110	19	3		3		138

[1]Includes 5 cases, delayed reports.

FINLAND

Notifiable diseases—August 1945.—During the month of August 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	21	Ophthalmia neonatorum	1
Chickenpox	158	Paratyphoid fever	2,622
Conjunctivitis	13	Pneumonia (all forms)	611
Diphtheria	1,175	Poliomyelitis	193
Dysentery, unspecified	206	Puerperal fever	38
Gastroenteritis	13,569	Rheumatic fever	348
Gonorrhea	2,509	Scabies	3,058
Hepatitis, epidemic	711	Scarlet fever	155
Influenza	397	Syphilis	383
Laryngitis	7	Typhoid fever	47
Malaria	116	Vincent's angina	63
Measles	32	Whooping cough	1,826
Mumps	130		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Belgian Congo—Kateri.—For the week ended October 27, 1945, 7 fatal cases of suspected plague were reported in Kateri, Belgian Congo.

Great Britain—Malta.—For the week ended October 27, 1945, 6 confirmed cases of plague with 1 death were reported in Malta, Great Britain.

Morocco (French).—For the period October 1–10, 1945, 24 cases of plague were reported in the region of Casablanca, French Morocco.

Palestine—Haifa.—For the week ended October 20, 1945, 2 cases of plague were reported in Haifa, Palestine. For the month of September 1945, 1 plague-infected rat was also reported in Haifa.

Smallpox

British East Africa—Tanganyika.—For the week ended September 22, 1945, 292 cases of smallpox with 40 deaths were reported in Tanganyika, British East Africa.

Rhodesia, Northern.—For the week ended September 22, 1945, 308 cases of smallpox with 2 deaths were reported in Northern Rhodesia.

Typhus Fever

Egypt.—For the week ended September 29, 1945, 18 cases of typhus fever including 1 case in Damietta, were reported in all of Egypt. For the week ended October 20, 1945, 1 case of typhus fever was reported in Ismailiya and 2 cases were reported in Port Said.

Morocco (French).—For the period October 1–10, 1945, 113 cases of typhus fever were reported in French Morocco, including 71 cases in the region of Casablanca, 26 cases in the region of Meknes, and 11 cases in the region of Rabat.

The Netherlands—Correction.—The report of 158 cases of typhus fever in the Netherlands during the period January–June 1945 (PUBLIC HEALTH REPORTS, September 28, 1945, p. 1161, and October 26, 1945, p. 1292) was erroneous. Senior Surgeon H. R. Sandstead, formerly Chief of the Public Health Branch, British and USFET Mission to the Netherlands, reports cases in that country as follows: 1943—4 cases; 1944—6 cases; January–June, 1945—51 cases. All of the cases reported for 1945 occurred in displaced persons repatriated from Germany, and 37 of them occurred in June.

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FEDERAL SECURITY AGENCY

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Public Health Reports

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STUDIES OF THE ROLE OF FUNGI IN PULMONARY DISEASE

I. CROSS REACTIONS OF HISTOPLASMIN[1]

By C. W. EMMONS, *Principal Mycologist*, and B. J. OLSON, *Surgeon, United States Public Health Service*; and W. W. ELDRIDGE, *Director of Medical and Surgical Service, St. Elizabeths Hospital*

The development of techniques and facilities for mass X-ray of populations during the past 10 years has resulted in the demonstration of pulmonary lesions in many persons who have no obvious symptoms or history of illness. From a public health, medical, or the patient's viewpoint, the significance of these lesions depends upon their etiologies. In many of these cases clinical and laboratory examinations do not indicate a tuberculous etiology, and mycological examinations usually fail to demonstrate significant fungi. The laboratory methods of examination are unsatisfactory because in many cases the lesions revealed by mass X-ray survey are quiescent and therefore no satisfactory sputum or exudate is available. When direct methods of laboratory study are not applicable it is logical to utilize immunological procedures as aids in diagnosis.

The isolation of *Histoplasma capsulatum* from a hilar lymph node of a Tennessee child with pulmonary calcification led us to pursue further the possible role of histoplasmosis in "atypical pulmonary disease." However, no further isolations of *H. capsulatum* were made in a series of 35 cases with pulmonary calcification studied at autopsy.[2] A search for this fungus in sputum in "atypical pulmonary disease" in Tennessee, Alabama, and Ohio also failed to yield additional isolations (*10*). It was felt that before the possible role of histoplasmosis in pulmonary lesions could be thoroughly assessed a skin-testing antigen should be used. Accordingly histoplasmin was prepared and its potency and specificity have been tested in animals and in man, as reported herein.

[1] From the Division of Infectious Diseases, National Institute of Health, and St. Elizabeths Hospital.

[2] Study to be reported in a separate paper.

PREPARATION OF ANTIGEN

Histoplasmin is a sterile broth filtrate of a culture of *H. capsulatum*. Van Pernis, Benson, and Holinger (*14*) prepared histoplasmin from dextrose broth cultures of the fungus. They observed an immediate reaction when the undiluted filtrate was injected intradermally in their patient and in experimentally infected mice. A delayed reaction was observed in dilutions up to 1:1,000. An acetone precipitate of the filtrate also elicited reactions. Zarafonetis and Lindberg (*15*) also reported the preparation and use of histoplasmin. This antigen has been prepared by a number of other investigators but the method of preparation has not been standardized.

The histoplasmin used in our investigations was prepared by growing strains of *H. capsulatum* on a synthetic broth medium made according to the formula recommended by Dr. C. E. Smith for the preparation of coccidioidin [3] (*13*).

1-Asparagin	14.00 gm.
Dipotassium phosphate c. p. (K_2HPO_4)	1.31 gm.
Sodium citrate c. p. ($Na_3C_6H_5O_7$–5½H_2O)	0.90 gm.
Magnesium sulphate (U. S. P.) ($MgSO_4$–7 H_2O)	1.50 gm.
Ferric citrate (U. S. P.) VIII (Scales)	0.30 gm.
Dextrose of the grade known as Cerelose (U. S. P. X.)	10.00 gm.
Glycerine c. p. (U. S. P.)	25.00 gm.
Water to make	1,000.00 ml.

This is similar to the medium used in making tuberculin. Experience has shown that this culture medium itself does not sensitize or elicit nonspecific reactions. The medium was dispensed in 3-liter Erlenmeyer flasks, 1,500 ml. per flask, and autoclaved. Bits of dry mycelium from agar slant cultures of *H. capsulatum* were floated on the surface of the broth, and the inoculated cultures were then incubated in a dark cupboard at room temperature for periods varying from 2 to 4 months (in one lot, 7 months). At the end of the incubation period the flask was shaken to immerse all the floating mycelium and on the following day the broth was filtered through a Berkefeld N filter and tested for sterility. Merthiolate was added to give a final concentration of 1:10,000, and the material was bottled without either concentration or restoration to original volume. The color of the filtrate was a clear amber.

The histoplasmin (H3) used most extensively in the investigations reported here, and used by Palmer in testing student nurses (*11*) was a filtrate of cultures 7 months old. Two strains of *H. capsulatum* were grown separately in the preparation of this lot and the filtrates pooled.[4] One was the strain already mentioned, which was isolated in this laboratory from a case with pulmonary calcification, and the second was the strain isolated by Van Pernis et al. (*14*), and kindly sent to us when requested immediately after their report was published

[3] Personal communication.
[4] The pooling of cultures is a customary procedure in the preparation of coccidioidin.

in 1941. This lot of histoplasmin was darker in color than other lots prepared, presumably because of the long period of incubation and the consequent concentration of culture ingredients and metabolic products. However, it was similar in antigenicity to all other lots prepared (see table 2). The other fungus antigens discussed in this paper were prepared from cultures incubated 80 to 100 days before filtration.

Several other fungus antigens were prepared in a manner similar to that described above, but only blastomycin, coccidioidin, and haplosporangin will be compared with histoplasmin in this report. Blastomycin was prepared from broth cultures of *Blastomyces dermatitidis*, coccidioidin from cultures of *Coccidioides immitis*, and haplosporangin from cultures of *Haplosporangium parvum*, a fungus causing pulmonary disease in wild rodents and immunologically related to *C. immitis*. Lots of filtrate were not pooled except in the case of lot No. 3 of histoplasmin.

TOXICITY OF HISTOPLASMIN

One milliliter of undiluted histoplasmin was injected intraperitoneally into each of four guinea pigs and this dose was repeated 1 week later. Three guinea pigs were similarly tested with 0.5-ml. doses. No toxic reactions were observed.

Four young white mice (average weight 20 gm.) received injections of 0.5 ml. of undiluted histoplasmin in the tail vein and this dose was repeated 1 week later. Similar groups of mice received similar repeated injections of dilutions of 1:10 and 1:100 of histoplasmin. No toxic reactions were observed.

HISTOPLASMIN SKIN REACTIONS IN GUINEA PIGS

Twelve normal white guinea pigs were tested by the intradermal injection of 0.1 ml. of each of three dilutions of histoplasmin, viz, 1:10, 1:100, and 1:1,000. No animals reacted to these dilutions. Repeated intradermal tests of four of these guinea pigs and of other control groups gave no indication that histoplasmin as used in intradermal testing is primarily irritating or sensitizes guinea pigs. Sixteen additional normal guinea pigs were skin tested with histoplasmin 1:100 before being experimentally inoculated with *Histoplasma*, and 24 normal guinea pigs were skin tested with histoplasmin and blastomycin (both 1:100) before being inoculated with *Blastomyces*. None of these normal animals reacted to the antigens used.

Guinea pigs were infected by the intraperitoneal injection of a pooled heavy suspension of ground mycelium and spores of *H. capsulatum*. Rabbits were similarly infected by either intravenous or intraperitoneal routes and were skin tested with histoplasmin 3 weeks later. Guinea pigs were skin tested with histoplasmin 2

weeks after inoculation and at intervals thereafter. Preliminary studies indicated that 0.1 ml. of a dilution of 1:100 of histoplasmin was a suitable test dose for animals, and this dose and dilution were regularly used unless otherwise indicated.

Infected animals, with few exceptions, gave definite and easily read skin reactions to histoplasmin. There was no immediate reaction. The reaction in the guinea pigs reached its height in about 24 hours and sometimes disappeared in 48 hours. In sensitized rabbits the reaction reached its height in 24 to 48 hours and persisted for as long as 6 days. Only reactions showing an area of edema 5 mm. or more in diameter were read as positive. In a few cases only erythema was observed and these were recorded as negative. In most animals which failed to react there was no edema or erythema. In positive reactions the area of erythema usually corresponds almost exactly to the area of edema.

Of 39 guinea pigs with experimental histoplasmosis, 32 reacted to a 1:100 dilution of histoplasmin (table 1). Of the 7 failing to react to this dilution, 5 gave a positive reaction to a 1:10 dilution. We did not determine the reason for the failure of the 2 remaining animals to become sensitized. All of the 9 rabbits with experimental histoplasmosis reacted to histoplasmin (table 2). The potency of histoplasmin in demonstrating skin sensitivity in experimentally infected animals was thus clearly demonstrated.

CROSS REACTIONS WITH HISTOPLASMIN

Many investigators have observed the unreliability of fungus antigens when used as diagnostic agents in skin testing (*4, 6, 8, 9*). One cannot accept the specificity of a fungus antigen until it has been tested against other mycoses. Guinea pigs with other experimental mycoses were therefore skin tested with histoplasmin. The mycoses in which cross reactions were observed are recorded in table 1. The mycoses in which cross reactions were not observed were eliminated because an adequate study has not been completed.

TABLE 1.—*Cross reactions in experimentally infected guinea pigs*

Infected with—	Number of animals	Number reacting to 0.1 ml. of 1:100 dilution of— Histoplasmin	Blastomycin	Coccidioidin	Haplosporangin
Histoplasma	39	[1] 32	17	1	0
Blastomyces	8	8	7	1	0
Coccidioides	7	2	0	6	0
Haplosporangium	7	6	6	4	5

[1] 5 additional animals reacted to histoplasmin 1:10.

Of eight guinea pigs experimentally infected with *Blastomyces dermatitidis*. eight reacted to histoplasmin, seven to blastomycin,

and one to coccidioidin. Of seven experimentally infected with *Coccidioides immitis*, two reacted to histoplasmin, and six to coccidioidin. However, these animals were very ill when tested, and it is possible that additional animals would have reacted if a more chronic form of this mycosis had been induced. Of seven guinea pigs experimentally infected with *Haplosporangium parvum*, six reacted to histoplasmin, six to blastomycin, four to coccidioidin, and five to haplosporangin. Of nine rabbits with experimental histoplasmosis, nine reacted to histoplasmin and eight to blastomycin (table 2).

TABLE 2.—*Skin reactions to different lots of histoplasmin and to blastomycin in rabbits experimentally infected with* Histoplasma capsulatum

Number of animals	Reacting to 0.1 ml. of 1:100 dilution of—					
	Histoplasmin lots					Blastomycin
	H3	H4	H5	H6	H7	B4
9	9	9	9	9	8	8

The cross reaction with blastomycosis was particularly interesting, and an examination of the sensitizing ability of different strains of *B. dermatitidis* seemed indicated. Three sets of eight guinea pigs each were infected with strains of *B. dermatitidis* as indicated in table 3.

TABLE 3.—*Skin reactions in guinea pigs with experimental blastomycosis*

Infecting strain	Number of animals	Reacting to histoplasmin 1:100		Reacting to blastomycin 1:100
		H3	H4	B4
6009	8	6	4	7
6011	8	7	6	8
6014	8	8	6	8

There appeared to be a slight difference in the sensitizing ability of the three strains of fungus used, but in view of the small numbers of animals tested and the inherent inaccuracies in skin testing, it is doubtful whether these differences would be apparent if the animals had been reinoculated, or if lower dilutions of the antigen had been used in testing.

TITRATION OF HISTOPLASMIN AND BLASTOMYCIN

The obvious cross reaction between histoplasmin and blastomycin was further studied by a titration of the antigens (table 4). The 24 guinea pigs mentioned above were divided into 3 groups of 8, each group having been infected with a different strain of *B. dermatitidis*; 18 guinea pigs were experimentally infected with pooled cultures of

TABLE 4: PART 1.—*Titration of histoplasmin and blastomycin in guinea pigs with experimental histoplasmosis*

Animal No.	Infecting strain *Histoplasma*	End point			
		Histoplasmin No. 3		Blastomycin No. 4	
		Positive	Negative	Positive	Negative
2635	Pooled	1:5,000	1:10,000	1:5,000	1:10,000
2565	do	1:5,000	1:10,000	1:1,000	1:5,000
2561	do	1:5,000	1:10,000	1:400	1:800
2631	do	1:5,000	1:10,000	1:200	[1] 1:400±
2630	do	1:5,000	1:10,000	—	—
2640	do	1:5,000	1:10,000±	1:1,000	1:5,000±
2563	do	1:1,600	1:5,000	1:800	1:1,000
2579	do	1:1,600	1:5,000	1:400	1:800
2629	do	1:1,600	1:5,000	1:200±	1:400±
2634	do	1:1,600	1:5,000	1:400	1:800
2638	do	1:1,000	1:5,000±	1:1,000	1:5,000±
2639	do	1:1,000	1:1,600±	1:200	1:400
2580	do	1:1,000	1:1,600±	—	1:200
2632	do	1:1,000	1:1,600	—	1:200
2578	do	1:800	1:1,000	1:400	1:800
2566	do	1:200	1:400	—	1:200
2567	do	—	—	—	—
2636	do	—	—	—	—

[1] The designation ± indicates a reaction less than 5 mm. in diameter.

TABLE 4: PART 2.—*Titration of histoplasmin and blastomycin in guinea pigs with experimental blastomycosis*

Animal No.	Infecting strain *Blastomyces*	End point			
		Histoplasmin No. 3		Blastomycin No. 4	
		Positive	Negative	Positive	Negative
2776	6014	1:10,000	1:20,000	1:5,000	1:10,000
2772	6011	1:1,600	1:5,000	1:1,600	1:5,000
2774	6014	1:1,600	1:5,000	1:1,600	1:5,000
2775	6014	1:1,600	1:5,000	1:1,600	1:5,000
2778	6014	1:1,600	1:5,000	1:1,600	1:5,000
2779	6014	1:1,600	1:5,000	1:1,600	1:5,000
2768	6011	1:1,600	1:5,000	1:1,600	1:5,000
2769	6011	1:1,600	1:5,000	1:1,600	1:5,000
2770	6011	1:1,600	1:5,000	1:1,600	1:5,000
2771	6011	1:1,600	1:5,000	1:1,600	1:5,900
2762	6009	1:1,600	1:5,000	1:200	1:400
2773	6014	1:1,000	[1] 1:5,000±	1:5,000	1:10,000
2758	6009	1:800	1:1,600±	1:800	1:1,600±
2761	6009	1:400	1:800	1:1,600	1:5,000
2777	6014	1:400	1:800±	1:400	1:800
2763	6009	1:400	1:800	1:1,600	1:5,000
2764	6009	1:400	1:800±	1:1,600	1:5,000
2766	6011	1:400	1:800±	1:400	1:800
2760	6009	1:200	1:400	1:800	1:1,600±
2767	6011	1:200	1:400	1:400	1:800±
2757	6009	—	1:200	1:1,600	1:5,000
2765	6011	—	1:200	—	1:200
2780	6014	—	1:200	—	1:200
2759	6009	—	1:200±	—	1:200

[1] The designation ± indicates a reaction less than 5 mm. in diameter.

H. capsulatum. These animals were skin tested with histoplasmin and blastomycin diluted 1:200, 1:400, 1:800, 1:1,000, 1:1,600, 1:5,000, 1:10,000, and 1:20,000. Guinea pigs with experimental histoplasmosis reacted more consistently and usually to a higher dilution of histoplasmin than to blastomycin in this series. Guinea pigs with experimental blastomycosis reacted similarly to histoplasmin and blastomycin.

The fact that histoplasmin cross reacts so completely with blastomycin in experimental blastomycosis and to a lesser degree in experimental histoplasmosis may be due to a lower potency of the blastomycin or to an as yet unknown factor in the sensitization of the guinea pigs in these two diseases. There seems to be an almost complete cross reaction between histoplasmin and blastomycin in experimental blastomycosis and histoplasmosis in guinea pigs.

HISTOPLASMIN AND BLASTOMYCIN TESTS IN PATIENTS

The authors have had under study in St. Elizabeths Hospital a group of 69 patients with atypical pulmonary lesions. After laboratory and clinical studies extending over a period of 3 years had failed to establish a tuberculous, mycotic, or other etiology, this group of patients and a comparable group of patients without pulmonary pathology were tested with histoplasmin, blastomycin, and coccidioidin. For this report, which is concerned with a comparison of antigens, both groups are tabulated together as the skin-testing results did not vary between the groups.[5] Except for seven patients (six Negroes and one Indian) all were white adults.

All individuals were initially tested with 0.1 cc. of a 1:1,000 dilution of each antigen intradermally. A reaction was considered positive if it had 5 x 5 mm. edema. As shown in table 5, 55 of 136 (40.4 percent) reacted to histoplasmin, 35 (25.7 percent) reacted to blastomycin, and 34 (25 percent) reacted to both antigens. The table also shows that the histoplasmin picked up 34 of 35 (97.1 percent) of those positive to blastomycin, while the blastomycin picked up 34 of 55 (61.8 percent) of those positive to histoplasmin.

TABLE 5.—*Cross reactions of histoplasmin and blastomycin in patients*

	Blastomycin 1:1,000		Total
	Positive	Negative	
Histoplasmin 1:1000:			
Positive	34	21	55
Negative	1	80	81
Total	35	101	136

In this series of cases, the incidence of positive reactions to histoplasmin and blastomycin was related to sex, being twice as high in males as in females (table 6). All of these patients were mentally ill and had been hospitalized for varying intervals. The age distribution given in table 5a shows that the majority were over 50 years

[5] The clinical, roentgenological, and laboratory studies on both the patients with atypical pulmonary lesions (infiltrations of the lung parenchyma of varying degrees) and the "normal" group will be reported in a separate paper.

TABLE 5a.—*Skin reaction to 0.1 cc. histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 in 136 patients by age groups*

Age group	Sex			Histoplasmin				Blastomycin				Coccidioidin			
				Positive		Negative		Positive		Negative		Positive		Negative	
	Male	Female	Total	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
20-29	0	2	2	0	0	2	100.0	0	0	2	100.0	0	0	2	100.0
30-39	4	1	5	0	0	5	100.0	0	0	5	100.0	0	0	5	100.0
40-49	13	5	18	6	33.3	12	66.7	4	22.2	14	77.8	1	5.6	17	94.4
50-59	25	11	36	18	50.0	18	50.0	10	27.8	26	72.2	0	0	36	100.0
60-69	28	14	42	15	35.7	27	64.3	11	26.2	31	73.8	1	2.4	41	97.6
70-79	15	15	30	14	46.7	16	53.3	10	33.3	20	66.6	3	10.0	27	90.0
80 and over	3	0	3	2	66.7	1	33.3	0	0	3	100.0	0	0	3	100.0
Total	88	48	136	55	40.4	81	59.6	35	25.7	101	74.3	[1] 5	3.7	131	96.3

[1] The 5 individuals positive to coccidioidin were also positive to both histoplasmin and blastomycin.

TABLE 6.—*Skin reaction to histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 according to sex*

	Total number	Histoplasmin				Blastomycin				Coccidioidin			
		Positive		Negative		Positive		Negative		Positive		Negative	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Males	88	43	48.9	45	51.1	29	32.9	59	67.1	4	4.5	84	95.5
Females	48	12	25.0	36	75.0	6	12.5	42	87.5	1	2.1	47	97.9
Total number	136	55	40.4	81	59.6	35	25.7	101	74.3	5	3.7	131	96.3

of age. However, it is interesting that not only was the incidence of positive histoplasmin and blastomycin reactions about the same in the different age groups studied, but two of the individuals tested who were over 80 years of age were positive to histoplasmin. One of these, when retested, was positive to blastomycin 1:100. The relationship of positive reactions to the time of residence in the hospital is given in table 7. The results suggest that the duration of residence in the hospital did not influence the incidence of positive reactions. This suggests the possibility that whatever the factor that induces this sensitization, once an individual becomes sensitized, this condition may in some instances persist for many years.

The results from skin tests with these antigens are dependent upon the potency of the antigen and the "degree of sensitization" of the individual tested. (The potencies of the antigens, histoplasmin and blastomycin, are roughly quantitated for guinea pigs in the titration given in table 4.) The "degree of sensitization" of the individuals tested with the antigens was not precisely determined. Over 80 percent of the reactions reported had an area of edema over 1 cm. in diameter. The largest reaction to histoplasmin in a 1:1,000 dilution

TABLE 7.—*Skin reaction to histoplasmin 1:1,000, blastomycin 1:1,000, and coccidioidin 1:1,000 in 136 patients according to years of residence in hospital*

Years in hospital	Total number	Histoplasmin				Blastomycin				Coccidioidin			
		Positive		Negative		Positive		Negative		Positive		Negative	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
0-1	5	2	40.0	3	60.0	1	20.0	4	80.0	0	0	5	100.0
1-4	22	10	45.5	12	54.5	8	36.4	14	63.6	1	4.5	21	95.5
5-9	22	7	31.8	15	68.2	6	27.3	16	72.7	1	4.5	21	95.5
10-14	20	9	45.0	11	55.0	4	20.0	16	80.0	1	5.0	19	95.0
15-19	14	4	28.6	10	71.4	2	14.3	12	85.7	1	7.1	13	92.9
20-29	20	9	45.0	11	55.0	5	25.0	15	75.0	1	5.0	19	95.0
30-39	27	11	40.7	16	59.3	7	25.9	20	74.1	0	0	27	100.0
40-49	5	2	40.0	3	60.0	2	40.0	3	60.0	0	0	5	100.0
50-59	1	1	100.0	0	0	0	100.0	1	100.0	0	0	1	100.0
Total	136	55	40.4	81	59.6	35	25.7	101	74.3	5	3.7	131	96.3

was an area of edema 64 mm. in diameter; to a similar dose of blastomycin, 47 mm. in diameter. Twenty-one individuals with reactions to histoplasmin of from 10 to 23 mm. in diameter were retested with histoplasmin 1:10,000 dilution and only one was positive to this higher dilution. This patient gave a reaction only 7 mm. in diameter. Evidently the 1:1,000 test dose of this lot of antigen is near the upper threshold of sensitivity of the individuals retested.

The blastomycin used in this study was probably not as potent an antigen for humans as the histoplasmin. The 21 individuals retested with histoplasmin at 1:10,000 were negative to blastomycin at 1:1,000. All but 2 of these, however, were positive to blastomycin at 1:100 dilution.

Cross reactions between histoplasmin and blastomycin observed in animals were confirmed by the results of skin testing on patients. So far as these studies indicate, a positive histoplasmin reaction may be due to sensitization to either *H. capsulatum*, *B. dermatitidis*, or some other antigenic agent as yet undetermined.

DISCUSSION

In any case of undiagnosed systemic disease, the possibility of a mycotic etiology should be considered. This problem of a differential diagnosis frequently arises in the case of pulmonary disease. The problem is accentuated by the current practice of roentgenological survey of populations which results in the demonstration of pulmonary lesions in many individuals not clinically ill. In many of these cases clinical and laboratory examinations do not indicate a tuberculous etiology and a search for significant fungi likewise is usually futile. Nevertheless, the suspicion remains that many of these lesions are mycotic in origin and attempts to establish diagnoses include procedures intended to demonstrate the presence of fungi.

In most cases of the sort under discussion there is no sputum or other pathological exudate which can be examined by microscope or culture, and it is natural to turn to immunological methods of diagnosis. These are notoriously unreliable in mycoses. Antibodies may be lacking, on the one hand, and cross reactions between different mycoses have been demonstrated repeatedly on the other. Immunological data therefore may be almost worthless in the diagnosis of a given case. Coccidioidin is the best known and most widely used of the fungus antigens, and its extensive use in skin testing has yielded epidemiological information of great interest and importance. Its limitations as a diagnostic agent are well known, however. Skin sensitivity to coccidioidin is retained for many years, and a positive skin reaction may indicate merely sensitization acquired during a mild or nonapparent infection during earlier residence within an endemic area. It may have no relationship to an infection in which a diagnosis is sought. Moreover, a small percentage of persons who have had no known exposure to *Coccidioides* react to coccidioidin. The significance of these aberrant reactions is not yet known. In the preparation of coccidioidin many lots have to be discarded because, when tested, they cause too many nonspecific reactions. Only certain lots, after critical test, are adjudged suitable for use. Histoplasmin and blastomycin share with coccidioidin the characteristics of possibly useful tools in epidemiological surveys. All have faults which seriously limit their usefulness as diagnostic materials.

X-ray studies of groups in the general population have shown striking geographical differences in the distribution of pulmonary calcification *(3)*. Pulmonary calcification is found frequently in tuberculin-negative individuals (*5*, *7*, *10*). In an epidemiological study of these lesions in Ohio such a high incidence was found in individuals with no known exposure to tuberculosis that it was concluded they resulted from an unrecognized disease of very common occurrence (*10*). Palmer (*11*) has recently reported that, in a group of student nurses studied, 91.5 percent of those with pulmonary calcification reacted to histoplasmin or tuberculin or both, and that of 2,141 who were negative to both tuberculin and histoplasmin only 1.2 percent had pulmonary calcification.

Aronson, Saylor, and Parr (*1*) found a correlation between pulmonary calcification and coccidioidin skin reactions within the endemic area of coccidioidomycosis, and Cox and Smith (*2*) demonstrated *Coccidioides* in calcified pulmonary nodules.

It is probable that our present concepts of histoplasmosis are incomplete. The disease, world-wide in distribution, is recognized as a generalized, almost invariably fatal disease (*12*). Localized, nonsystemic lesions have been reported in only a few cases. We shall report later the case of a child with pulmonary calcification in which

histoplasmosis was apparently only a concomitant infection not important as a cause of the patient's death. The strain of *Histoplasma* isolated from a hilar lymph node of this child was used in the preparation of histoplasmin No. 3.

From the results obtained with blastomycin in this study it also is shown to be an antigen which produces a definite easily readable skin reaction. The reaction, however, is not specific, as shown by its cross reactions with histoplasmin and haplosporangin. It is possible that when histoplasmosis and blastomycosis are more fully known, both will prove to have benign, self-limited forms corresponding to the Valley fever (primary) type of coccidioidomycosis.

SUMMARY AND CONCLUSIONS

1. Histoplasmin, blastomycin, coccidioidin, and haplosporangin were prepared by procedures similar to those used in making coccidioidin. Cross reactions between the four antigens were demonstrated.
2. A dilution of 1:100 of histoplasmin gave a positive reaction in guinea pigs with experimental histoplasmosis, blastomycosis, coccidioidomycosis, and haplomycosis.
3. Thirty-four of one hundred and thirty-six hospitalized persons reacted to both histoplasmin and blastomycin.
4. The significance of the surprisingly high incidence of positive reactions to histoplasmin and blastomycin in man remains to be determined. We are not at present in a position to evaluate the clinical or epidemiological significance of these positive reactions as they occur singly or together, in view of the demonstrated cross reactions between these antigens.

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HEALTH EDUCATION IN THE PUBLIC HEALTH PROGRAM[1]

By MAYHEW DERRYBERRY, *Chief, Field Activities in Health Education*

Health education is universally accepted as an essential part of the public health program. Descriptions of the control activities for such diseases as tuberculosis, venereal disease, malaria, the acute communicable diseases, cancer, and the degenerative diseases always list health education as one of the important and necessary parts of the program. Even persons engaged in inspection and law enforcement have more recently stated that health education is a necessary tool in assisting them to achieve their objectives.

Coupled with this universal agreement on the importance of health education, there is almost complete disagreement on what constitutes a good health education program. In one department, a series of news releases, radio broadcasts, and occasional talks to groups on invitation constitute the health education program. In another, health education activities are all centered on the school child with syllabi, pamphlets, posters, and essay contests, special campaigns, and similar activities. In a third, the program consists of the production and distribution of films, pamphlets, posters, radio transcriptions, and the use of special mobile visual units to take the message to the people. In the fourth, every member of the staff carries on health education in daily contacts, and no other type of planned educational program is undertaken. In still a fifth, the emphasis is on the solving of health problems by the people of the community utilizing the technical guidance which the health department can provide.

This wide variance in programs arises in part from the difference in objectives to be served by the health education activities. In the early days of public health the provision of facilities for purification of the water supply or the passage of legislation providing for the

[1] From the Division of Public Health Methods. Read before the Conference of State and Territorial Health Officers at their Annual Meeting in Washington, D. C. April 1945.

pasteurization of milk would prevent much illness regardless of the knowledge or behavior of the people. All the health education needed was that required to win the support of sufficient people in the community to assure the appropriation of the funds or the passage of the legislation.

Today, however, public health has developed to the point where it has become apparent that many diseases cannot be controlled without full citizen understanding and participation. The provision of X-ray and diagnostic facilities, sanatoria, and rehabilitation services will not reduce tuberculosis unless people know the value of an X-ray of the chest, have one taken periodically, and take the necessary treatment if a diagnosis of tuberculosis is made. The best tumor clinics in the world will not reduce the mortality from cancer unless citizens avail themselves of the diagnostic service they provide and take treatment as indicated. Thus, the principal objective of health education today is the stimulation of public action and individual participation in preventive health activities.

This over-all objective of citizen participation is much more difficult than enlisting support for the program of the health department. First of all, it is difficult because everyone, including the housewife, the laborer, the white collar worker, the domestic, and the unemployed, must become informed on how to protect his health and act on that knowledge. Secondly, it is difficult because few people are interested in their own health sufficiently to do anything about it—at least not until they get sick. Therefore, it requires an intensive educational program to achieve any degree of success.

Realizing some of the difficulties involved, the Public Health Service in cooperation with several States set out in 1941 to experiment in the methods of stimulating individuals to participate in the solution of individual and community problems. The program began by assigning persons trained in public health and education to work as regular members of local health departments. The tasks of these workers were those prescribed by the Committee on Professional Education of the American Public Health Association in its statement of the functions in health education:

To assist in planning and organizing a program of health education suitable to the area of assignment.

To aid the community in organizing itself to find and solve its health problems.

To assist in promoting, organizing, and guiding study programs in health for various groups in the community.

To contribute to the improvement of the quality of health education of the school child through work with teachers, supervisors, and administrators.

To conduct an informational service for the purpose of answering citizens' inquiries about health.

To prepare, select, assemble, and distribute health education materials as needed to meet the community needs.

To conduct a speaker's bureau, conferences, meetings, and radio programs.
To assist with the in-service training of public health personnel.
To provide for a continuing appraisal of the health education activities.

Some of you may say, "But these tasks are the functions of all members of the health department staff." It is true that these broad educational functions are part of the responsibility of the total staff, but what does adequate performance of these tasks require?

Let us look at the health educator as he or she undertakes to work on only two of these functions, namely, assisting the community in organizing itself to find and solve its health problems and to promote study programs among various groups. As a beginning, he must know what organizations already exist in the community, what they know, what they do, who directs them, and their interests. One health educator in a community of 60,000 found over 200 agencies and organizations in the community. It was her first task to learn something about them, how many people were members, what they had already done in health education, and if they were willing to expand their program. It was particularly important to ascertain what proportion of the population had membership in the various organizations and what proportion would be left out of any program that worked only through existing organizations.

To gain this information she interviewed over 300 people in about 2½ months' time. These included representatives of the medical and dental societies, and other professional community representatives such as school authorities, welfare leaders, agricultural workers, voluntary agency executives, and a host of lay leaders in both the rural and urban parts of the community.

In addition to finding out what agencies there were, their interests, and their activities, these preliminary interviews were made to learn what information as well as what misinformation existed in the community. What did the people know about the health department and its program? Were they confused about its activities? For example, here are a few of the questions which citizens have asked during interviews by the health educator:

What does a health officer do except put up placards?

Why should I be interested in public health? It is only for the poor people. It is not important to me.

Does a public health nurse have to be as well trained as our hospital nurses?

(Most of these interviews were conducted in areas served by above-average health departments.) These are attitudes the health educator must know before a program is begun. He must be prepared to interpret the work of the health department in a very elementary fashion in such situations.

Oftentimes the people in the community feel that there are no health problems. The president of the Parent-Teachers Association

in one community of 60,000 stated that she had read about the great reduction in the tuberculosis death rate and was sure there was no need to do anything about tuberculosis in her community. Actually, there had been an average of 100 deaths per year during the past 5 years and 83 new cases had been discovered within the year.

A home demonstration agent in a county of 75,000 seriously reported when interviewed that there was no further need for venereal disease education in that community for it had been covered by a 5-minute presentation to all of the 700 members of her clubs during the past year.

Certainly such misconceptions and lack of understanding must be removed before constructive health education can take place.

Without such intimate knowledge, the health education lecture, film, news release, or pamphlet may miss the mark and accomplish no good whatsoever.

Interviewing to uncover the necessary information is time consuming and demands skillful handling. It requires more intensive work than the health officers, nurses, or sanitarians can spare from their own professional tasks. Yet this preliminary step has great potentialities for building and extending public relations in all directions. It involves a real sense of timing, an ability to get along with all classes of people, and an awareness of the fact that people when properly approached can be stimulated and guided to assume an active part in various public health programs. If, however, the interviews are not skillfully conducted, people will not be stimulated to work on the problems of the community. Instead, they may become antagonistic and oppose any activity, particularly if they feel a set program is being forced upon them.

Out of these interviews grows actual planning at the level of development within the community. Study group meetings are held and people learn of problems on which they plan to do something. No more does the health officer receive such generalized invitations as, "Would you come out to the East Side Garden Club and speak on some health subject which you think would interest our members?" Instead, the invitation is specific. "Can you come out and discuss with us how we can get more well-baby clinics in the eastern section of town?" or "What can be done about getting sanatorium care for the tuberculosis cases which have been found in this community?"

The preliminary interviews not only result in more meaningful invitations, they also greatly increase the number of groups that ask for information. In one community where only 32 meetings had been held during the 3 years prior to the arrival of a health educator, the number mounted to 400 during the first year and a half of her work in that area. In attendance at many of the meetings to provide the technical information the people wanted were the health officer, the

the sanitary engineer, depending on the problem under ation. Thus, the educational work by the other members of ff became more effective and reached a larger number of people se of the preliminary arrangements and planning done by the th educator.

n order to serve all the groups that want information from the ealth department, the staff must be willing to meet with groups at he time they want to meet. This will mean meetings at night as well as during the regular working day. In one or two health departments we have found health officers who felt that night work by the health educators was unnecessary. They objected to the irregular schedule of the health educators. Certainly the objection could have arisen only from a misunderstanding of health education.

As groups in the community become informed about the problems, they undertake to sponsor various health department activities such as: Well-child conferences, maternity classes, early diagnosis drives for tuberculosis, rat campaigns, and food-handler classes. Thus, the health department finds itself being asked to do the things it was set up to do and has been wanting to get under way. The people feel responsible for the success of the activity instead of blaming the health department for not being more efficient.

From the above discussion it should be fairly clear that health education should be a generalized, continuing function. The effectiveness of the health educator is greatly restricted when his work is limited to one subject, such as tuberculosis, venereal disease, cancer, or dentistry. Furthermore, if there is a special health educator for each specific public health activity, the several programs compete with one another for public attention and this competition seriously detracts from the effectiveness of any one of them.

Turning to another function, such as school health education, we find the health educator equally active in learning about the present program in the school. Do the teachers understand and maintain a healthful environment for the children? Are the window shades adjusted properly? Is the heat well regulated? Are toilet rooms kept clean and supplied with water, soap, and towels? (In one school a health educator found that the boys' toilet was locked and had been for 4 months because of a burst pipe.)

What is being done to find the children who need medical attention? Are the teachers sensitized to behavior symptoms which they should recognize and bring to the attention of a physician? Is anything done about children who are found needing attention?

Is the health instruction devoted to the study of health problems of the school and community, or are the health periods devoted entirely to physical education or lessons in anatomy?

After learning the program in the school, the health educator works

with the school staff on real problems. Once the group is concerned about some problem, the health instruction period is no longer a period of entertainment where someone from the health department brings in a film and shows it. Instead, the children seek answers to problems and the movie showing becomes a method of obtaining the necessary information.

Learning how to solve health problems is no different from learning arithmetic or geography. No educator would show a film on the process of addition or put up a poster showing the boundaries of a State and expect the students to learn addition or geography from such passive experiences. Instead, these techniques might be used to stimulate interest or provide information, but learning the information in a way that will influence behavior requires more intensive participation on the part of the learner.

It is the health educator's task to be resourceful in working with the teachers, to assist them in setting up problem-solving situations for the children, to provide informational material in the form of references, pamphlets, visual aids, and technical personnel who can answer questions raised by children; to arrange observational tours and work experience in health agencies. In short, she guides the teacher to the proper technical sources for information and assists her in evaluating materials, when the advice from various sources differs.

To go into similar detail on all the functions ascribed to health education earlier in this paper is impossible. It should be obvious, however, from the description of the activities of a health educator concerned with only two of the functions mentioned that the amount of work requires full-time personnel in every health department of the size prescribed by the Committee on Local Health Units of the American Public Health Association.

It should also be obvious that successful accomplishment of the many and varied tasks a health educator is asked to perform requires a well-trained individual. Certainly interviewing leaders in the community and stimulating their interest in a public health program should not be entrusted to an individual who is not thoroughly grounded in the basic public health sciences and the technique of interviewing as well. Likewise, work with the schools requires an intimate knowledge of education to assure success.

The number of individuals who are trained in public health and education is extremely small. Therefore, if effective programs are to be carried on in other areas, personnel must be trained.

As a beginning towards meeting the need for trained personnel, a grant of $40,000 from the W. K. Kellogg Foundation was obtained in January 1943, and 24 individuals (17 on fellowships from the W. K. Kellogg Foundation and the remainder on stipend from the States) began training in March. An additional grant of $32,000 was obtained

in June 1943 for the academic year 1943–44. The National Foundation for Infantile Paralysis made available $50,000 in 1944, and an additional $60,000 for the academic year 1945–46. These fellowships are to provide a reservoir of trained individuals from which future employees of the Public Health Service and private agencies may be recruited. The funds cannot be used to pay stipends for personnel now employed by State and local health departments. Grant-in-aid funds may be used at the discretion of the State health departments to provide training for such individuals.

The type of training which health educators should receive has been defined by the Committee on Professional Education. It includes basic preparation in the health sciences, education, and the social sciences. It is our belief they should have such basic public health courses as epidemiology, vital statistics, bacteriology, public health administration, environmental sanitation, school and community health education, and, in addition, courses in adult education, public relations, and sociology.

The functions of the health educator working in the local health department have been discussed in considerable detail because the employment of such individuals is a new development in a program of rapidly growing importance. This emphasis on the local program is not intended to detract from the importance of a strong Division of Health Education in the State health department. If, however, it is agreed that each local department shall have the services of a well-trained health educator, then the functions of the Division in the State department become analogous to the functions of other divisions at the State level. They are:

1. Planning, developing, and administering a State-wide program in public health education.

2. Encouraging and promoting the development of programs in local health departments, utilizing trained personnel who are capable of working in all phases of the public health program and are also sufficiently competent in education to work with the schools.

3. Recruiting personnel and arranging for their training and assignment.

4. Assisting the medical, nursing, and sanitation personnel in their educational work by providing them with an educational mechanism and advice on effective techniques of education in various local situations.

5. Consulting with local health departments and local health educators on all matters pertaining to health education.

6. Maintaining relations with the press and the public, preparing articles and approving special stories and speeches by department personnel.

7. Preparing or securing public health education material and distributing it through useful channels.

8. Correlating the educational endeavors of the other divisions or bureaus in the State health department.

9. Coordinating the activities of all agencies in the State interested in health education.

10. Developing and maintaining a continuing in-service program of training for public health personnel.

11. Evaluating continually the materials and methods being used both in the State and in the local departments.

To carry out this variety of tasks in the State health department, personnel with specialized training will be required. The production of materials—news releases, exhibits, and other visual aids—requires skills that are seldom found in an individual competent to direct the entire program. Larger departments can utilize a higher degree of specialization in their personnel than is possible for the smaller departments.

Since the Health Education Division and the local health educators will assist in all the special programs, such as venereal disease control, maternal and child health, tuberculosis control, and all other phases of the program, the financing of the program should be made from a pooling of grant-in-aid and State funds. If proper cooperative relationships can be established, voluntary agencies may also contribute to support of the over-all program. In several States, tuberculosis associations, parent-teacher groups, junior leagues, crippled children's societies, and other similar groups, participate in financial support.

It cannot be emphasized too strongly that successful health education programs require close working together of departments of health and education. The need for such coordination has been recognized by the Federal health and education agencies and a very satisfactory arrangement has been developed. The health educator on the Office of Education staff serves as consultant in health education to the Public Health Service, and the health educator on the Public Health Service staff holds an appointment as consultant in health education on the Office of Education staff. Through this mechanism we are able to coordinate our efforts in every way. Several States have recognized the need for such cooperation between departments of health and departments of education and have met it through a variety of administrative set-ups. It is hoped that out of these various working arrangements will evolve ways in which both departments can make their maximum contribution to the health of the people.

SUMMARY

Health authorities are becoming increasingly aware that many diseases are uncontrollable without the active participation of the people themselves. Stimulating public action and individual participation requires well-planned and coordinated programs of health education.

Demonstrations by several States and by the Public Health Service during the past 4 years have shown that people may be motivated to solve their own problems and to utilize the technical guidance of

their health department when there is on the staff of the local health department an individual skilled in community organization and also grounded in the fundamental sciences of public health, health education, and public relations.

Personnel so trained are unavailable at the present time. Health officers contemplating the initiation or expansion of their health education programs should be prepared to recruit and train personnel to man the program.

The Public Health Service stands ready on request to assist States in appraising their health education needs and in the development of comprehensive State plans based on the problems and resources within the State. It is also willing to make available to States the benefit of its experience in the recruitment of personnel for training.

The importance of health education in helping to realize fully practically all public health objectives has never been questioned. Only its methods have been criticized. Now that the elements of an effective program have been demonstrated, we can make progress as rapidly as funds and trained personnel become available.

DEATHS DURING WEEK ENDED OCTOBER 27, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Oct. 27, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,814	9,004
Average for 3 prior years	8,878	
Total deaths, first 43 weeks of year	384,867	386,224
Deaths under 1 year of age	586	629
Average for 3 prior years	669	
Deaths under 1 year of age, first 43 weeks of year	26,098	26,669
Data from industrial insurance companies:		
Policies in force	67,290,775	66,836,251
Number of death claims	12,128	13,211
Death claims per 1,000 policies in force, annual rate	9.4	10.3
Death claims per 1,000 policies, first 43 weeks of year, annual rate	10.1	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 3, 1945

Summary

The incidence of poliomyelitis continued to decline. A total of 390 cases was reported as compared with 489 last week, 451 for the corresponding week last year, and a 5-year (1940–44) median of 285. Of the 12 States reporting 10 or more cases each, increases occurred in only 2—Connecticut (from 8 to 11) and Missouri (14 to 21). The total for the year to date is 12,342, as compared with 17,888 for the corresponding period last year (which was about 93 percent of the total for the year) and a 5-year median of 8,713.

A total of 88 cases of meningococcus meningitis was reported, as compared with 95 last week, 73 for the next earlier week, and a 5-year median of 59. States reporting currently more than 5 cases each (last week's figures in parentheses) are as follows: New York 15 (11), Texas 8 (6), Illinois 7 (8) and California 7 (8). The total to date is 7,103, as compared with 14,628 and 15,573, respectively, for the epidemic years of 1944 and 1943, and a 5-year median of 2,970.

A total of 719 cases of diphtheria was reported (more than for the corresponding week of any of the past 5 years), as compared with 832 last week and 518 for the corresponding week last year. Eight States (Ohio, Michigan, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Tennessee) reported an aggregate of 357 cases as compared with 121 cases reported by the same States for the corresponding week last year. The total to date is 14,102, as compared with 10,775 for this period in 1944.

Of the other diseases listed in the tables following, the current figures for encephalitis, measles, scarlet fever, and whooping cough are above those for the corresponding week last year, and the cumulative figures for the dysenteries, leprosy, tularemia, whooping cough, and undulant fever, are in excess of those for the same period in 1944.

A total of 9,023 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,814 last week, 8,969 for the corresponding week last year, and a 3-year (1942–44) average of 8,752. The total for the year to date is 393,890, as compared with 395,193 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944	
NEW ENGLAND												
Maine	11	0	1	------	1	1	5	3	55	0	0	0
New Hampshire	0	0	0	------	------	------	0	0	0	0	0	0
Vermont	0	0	0	------	------	------	0	1	3	0	0	0
Massachusetts	2	5	2	------	------	------	225	54	157	1	8	4
Rhode Island	0	2	1	9	19	------	0	0	0	0	0	1
Connecticut	0	3	1	------	1	1	12	18	18	2	6	1
MIDDLE ATLANTIC												
New York	16	9	11	[1] 2	[1] 5	[1] 5	58	23	126	15	18	13
New Jersey	3	4	5	4	------	6	12	12	19	4	6	2
Pennsylvania	7	5	9	------	5	3	58	33	143	4	15	3
E. NORTH CENTRAL												
Ohio	41	12	18	7	2	11	7	11	26	5	15	2
Indiana	8	4	8	12	2	12	6	3	9	2	2	2
Illinois	2	3	16	4	1	3	142	8	38	7	8	2
Michigan [2]	24	18	7	------	8	2	117	13	127	3	4	3
Wisconsin	0	9	4	34	7	12	14	11	110	3	6	1
W. NORTH CENTRAL												
Minnesota	7	25	6	------	1	------	4	5	6	3	5	2
Iowa	9	17	8	------	------	1	5	1	21	1	2	0
Missouri	17	3	3	3	------	------	14	1	3	3	5	1
North Dakota	6	6	3	------	------	------	10	1	4	1	0	0
South Dakota	0	2	3	------	------	------	2	3	3	1	0	0
Nebraska	3	0	2	6	------	------	5	4	4	0	1	0
Kansas	2	2	4	------	2	2	8	5	5	0	0	0
SOUTH ATLANTIC												
Delaware	1	0	0	------	------	------	0	1	1	1	0	0
Maryland [2]	33	2	5	1	1	2	6	1	14	2	5	5
District of Columbia	0	0	1	------	------	------	2	2	2	0	2	1
Virginia	29	15	22	211	80	80	11	5	20	1	1	1
West Virginia	15	6	8	------	------	2	0	3	7	0	1	1
North Carolina	123	27	49	------	15	4	17	6	6	3	3	2
South Carolina	23	10	20	488	357	293	18	3	3	0	0	1
Georgia	41	29	25	4	50	25	8	2	2	0	0	1
Florida	8	17	8	7	2	3	0	11	3	2	2	0
E. SOUTH CENTRAL												
Kentucky	13	12	13	2	------	5	55	0	14	1	2	2
Tennessee	43	8	9	16	1	14	3	3	8	1	0	1
Alabama	33	35	23	32	27	28	3	1	5	1	3	3
Mississippi [2]	26	28	17	------	------	------	------	------	------	0	3	1
W. SOUTH CENTRAL												
Arkansas	31	27	19	93	66	31	2	6	2	0	2	0
Louisiana	12	17	14	3	------	2	2	1	1	0	1	0
Oklahoma	13	20	15	44	57	31	25	9	5	0	1	0
Texas	65	63	63	1,535	785	638	51	29	29	8	7	4
MOUNTAIN												
Montana	0	2	1	5	5	4	17	2	11	0	1	0
Idaho	0	3	0	7	------	------	56	3	3	0	0	0
Wyoming	0	2	0	------	------	4	2	3	4	0	0	0
Colorado	10	3	4	46	29	21	9	11	24	2	0	0
New Mexico	3	8	1	------	1	------	1	0	1	0	0	0
Arizona	1	4	4	34	60	68	3	0	8	1	1	0
Utah [2]	0	0	0	------	------	3	17	11	6	1	0	0
Nevada	0	0	0	------	2	------	0	2	2	0	0	0
PACIFIC												
Washington	3	20	6	------	------	------	119	11	11	2	1	2
Oregon	3	9	1	5	5	17	10	42	22	0	1	1
California	32	22	22	9	20	22	222	191	53	7	9	2
Total	719	518	518	2,623	1,612	1,553	1,363	569	1,771	88	147	59
44 weeks	14,102	10,775	12,408	85,595	349,179	175,897	110,156	596,558	554,188	7,108	14,628	2,970

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [2]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944		Nov. 3, 1945	Nov. 4, 1944	
NEW ENGLAND												
Maine	4	2	0	30	21	12	0	0	0	2	0	0
New Hampshire	0	1	1	6	7	7	0	0	0	0	0	0
Vermont	2	0	0	0	6	6	0	0	0	1	0	0
Massachusetts	20	8	7	87	107	140	0	0	0	3	2	2
Rhode Island	1	0	0	5	7	4	0	0	0	0	0	0
Connecticut	11	8	3	14	23	23	0	0	0	0	0	1
MIDDLE ATLANTIC												
New York	41	145	16	178	185	181	0	0	0	6	8	8
New Jersey	13	17	4	40	43	62	0	0	0	1	2	2
Pennsylvania	13	34	8	121	161	161	0	0	0	6	3	7
EAST NORTH CENTRAL												
Ohio	11	31	9	230	226	226	0	0	0	4	4	5
Indiana	8	5	2	82	62	43	0	0	1	1	1	1
Illinois	30	23	23	123	128	148	0	0	0	1	4	2
Michigan [1]	7	24	11	99	144	118	0	2	1	2	0	3
Wisconsin	43	7	7	74	78	121	0	1	0	1	0	1
WEST NORTH CENTRAL												
Minnesota	8	12	7	27	46	57	0	0	0	1	0	0
Iowa	18	6	2	53	40	55	0	0	1	0	2	2
Missouri	21	13	2	49	31	46	0	0	0	3	3	3
North Dakota	0	0	0	9	9	10	1	0	0	0	0	0
South Dakota	1	0	1	9	19	19	0	0	0	0	0	0
Nebraska	1	1	3	29	25	17	0	0	0	0	0	0
Kansas	8	4	4	73	93	60	0	0	0	0	2	1
SOUTH ATLANTIC												
Delaware	1	2	0	7	0	6	0	0	0	0	0	0
Maryland [1]	9	16	1	33	58	54	0	0	0	3	0	4
District of Columbia	4	0	0	19	20	12	0	0	0	3	1	0
Virginia	3	8	7	99	61	61	0	0	0	4	1	5
West Virginia	1	4	2	107	80	70	0	0	0	2	3	3
North Carolina	2	18	3	104	106	106	0	0	0	0	4	4
South Carolina	1	1	1	15	18	17	0	0	0	0	1	2
Georgia	3	3	0	32	37	37	0	0	0	7	0	7
Florida	4	4	1	9	8	7	0	0	0	1	1	2
EAST SOUTH CENTRAL												
Kentucky	1	9	5	78	48	64	0	0	0	5	5	5
Tennessee	11	2	0	83	23	59	0	0	0	6	2	1
Alabama	3	0	0	39	29	38	0	0	0	2	1	2
Mississippi [1]	5	2	0	20	20	14	0	0	0	2	2	2
WEST SOUTH CENTRAL												
Arkansas	3	0	1	32	30	11	0	0	0	2	13	9
Louisiana	6	2	2	29	17	8	0	0	0	1	4	4
Oklahoma	3	0	1	28	21	21	0	0	0	3	3	7
Texas	8	8	8	149	95	38	0	0	0	11	13	9
MOUNTAIN												
Montana	2	1	1	10	11	11	0	0	0	0	0	1
Idaho	4	0	0	14	40	14	0	0	0	0	0	0
Wyoming	0	0	0	10	5	5	0	0	0	0	0	0
Colorado	4	0	2	29	28	27	0	1	1	2	0	1
New Mexico	2	1	1	25	16	8	0	0	0	1	3	3
Arizona	1	0	0	6	7	2	0	0	0	1	1	1
Utah [1]	7	1	3	16	9	6	0	0	0	1	0	0
Nevada	0	0	0	1	1	1	0	0	0	0	0	0
PACIFIC												
Washington	4	9	9	32	42	42	0	0	0	0	1	1
Oregon	1	2	2	26	20	12	0	0	0	2	0	1
California	36	17	9	221	163	134	0	0	0	3	5	3
Total	390	451	285	2,601	2,474	2,474	1	4	7	94	95	110
44 weeks	12,342	17,888	8,713	151,246	162,990	116,334	302	340	689	4,365	4,881	6,111

[1] Period ended earlier than Saturday.
[2] Including paratyphoid fever reported separately, as follows: Massachusetts 2; Michigan 1; Georgia 1; Texas 1; Utah 1; Oregon 1; California 2.

Telegraphic morbidity reports from State health officers for the week ended November 3, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended Nov. 3, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, undulant	Undulant fever
	Nov. 3, 1945	Nov. 4, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	23	17	27	0	0	0	0	0	0	0	1
New Hampshire	8	0	3	0	4	0	0	0	0	0	1
Vermont	24	47	22	0	0	0	0	0	0	0	0
Massachusetts	188	95	168	0	34	0	0	0	0	0	4
Rhode Island	17	35	28	0	0	0	0	0	0	0	0
Connecticut	65	76	80	1	6	0	0	0	0	0	8
MIDDLE ATLANTIC											
New York	274	168	405	6	19	0	1	0	0	1	6
New Jersey	145	77	129	0	0	0	0	0	0	0	0
Pennsylvania	199	104	199	0	0	0	0	0	0	0	6
EAST NORTH CENTRAL											
Ohio	159	138	138	0	0	1	0	0	0	0	3
Indiana	31	1	19	0	0	1	0	0	0	0	2
Illinois	92	50	161	1	1	0	3	0	0	0	4
Michigan [3]	91	49	155	1	4	0	0	0	0	0	5
Wisconsin	63	73	174	0	0	0	0	0	0	0	7
WEST NORTH CENTRAL											
Minnesota	22	42	53	0	1	0	0	0	0	0	4
Iowa	4	3	20	0	0	0	0	0	0	0	0
Missouri	10	19	13	0	0	0	0	0	0	0	0
North Dakota	0	10	10	0	0	0	0	0	0	0	0
South Dakota	3	6	6	0	0	0	0	0	0	0	3
Nebraska	0	12	12	0	0	0	1	0	0	0	0
Kansas	16	21	35	0	0	0	0	0	0	1	4
SOUTH ATLANTIC											
Delaware	1	2	4	0	0	0	0	0	0	0	0
Maryland [3]	40	64	64	0	0	0	0	0	0	0	0
District of Columbia	7	6	7	0	0	0	0	0	0	0	0
Virginia	21	20	61	1	0	64	0	4	0	1	0
West Virginia	13	14	14	0	0	0	0	0	0	0	2
North Carolina	53	57	103	0	0	0	0	0	1	3	1
South Carolina	31	59	51	1	11	0	0	0	0	8	0
Georgia	15	6	11	0	2	1	0	0	1	46	3
Florida	3	23	18	6	0	0	0	0	0	3	0
EAST SOUTH CENTRAL											
Kentucky	21	15	63	0	0	6	0	1	1	0	2
Tennessee	38	11	20	0	0	2	0	0	0	4	1
Alabama	8	15	15	0	0	0	0	0	0	8	0
Mississippi [3]	------	------	------	0	0	0	0	0	0	2	3
WEST SOUTH CENTRAL											
Arkansas	14	32	30	5	3	0	0	0	0	0	0
Louisiana	1	0	3	0	0	0	0	0	0	6	3
Oklahoma	10	2	1	0	0	0	0	0	0	0	1
Texas	98	134	86	14	247	22	0	0	1	49	10
MOUNTAIN											
Montana	0	44	12	0	0	0	0	0	0	0	0
Idaho	20	5	6	2	0	0	0	0	0	0	0
Wyoming	0	2	8	2	0	0	0	0	1	0	0
Colorado	31	2	31	1	0	0	0	0	0	0	0
New Mexico	15	0	6	0	0	0	0	0	0	0	0
Arizona	5	3	3	1	0	16	0	0	0	0	0
Utah [3]	10	12	12	1	0	0	0	0	1	0	1
Nevada	5	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	20	15	53	0	0	0	0	0	0	0	0
Oregon	6	9	9	0	0	0	0	0	0	0	0
California	185	94	185	2	2	0	7	0	0	3	8
Total	2,055	1,694	2,804	45	334	113	12	5	6	130	88
Same week, 1944	1,694	------	------	60	790	124	6	3	7	134	69
Average, 1942–44	2,292	------	------	35	417	88	10	[4] 8	10	[4] 100	------
44 weeks: 1945	106,727	------	------	1,663	21,979	9,660	564	456	682	4,285	4,058
1944	81,128	------	------	1,584	20,540	7,761	570	447	478	4,426	3,402
Average, 1942–44	130,955	------	[4] 152,531	1,480	15,262	6,847	556	[4] 447	644	[4] 3,114	------

[3] Period ended earlier than Saturday.

[4] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended October 27, 1945

This table lists the reports from 84 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Massachusetts:												
Boston	0	0	------	0	4	2	10	17	20	0	0	21
Fall River	0	0	------	0	0	0	2	0	7	0	0	0
Springfield	0	0	------	0	1	1	0	0	5	0	0	5
Worcester	1	0	------	0	30	0	6	0	8	0	0	1
Rhode Island:												
Providence	0	0	------	0	0	0	3	0	3	0	0	6
Connecticut:												
Hartford	0	0	------	0	0	0	1	2	3	0	0	1
New Haven	0	0	------	0	0	0	2	0	1	0	0	0
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	1	1	0	2	3	5	0	0	13
New York	12	0	4	0	24	5	54	17	62	0	7	83
Rochester	0	0	------	0	1	0	2	2	6	0	0	6
Syracuse	0	0	------	1	0	0	3	0	9	0	0	17
New Jersey:												
Camden	1	0	------	0	0	0	1	0	1	0	0	4
Newark	0	0	1	0	5	1	5	3	3	0	0	31
Trenton	0	0	1	0	0	0	2	4	1	0	0	3
Pennsylvania:												
Philadelphia	1	0	2	1	6	1	13	5	28	0	3	82
Pittsburgh	0	0	------	0	1	3	5	6	18	0	1	4
Reading	0	0	------	0	0	0	1	0	0	0	0	7
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	3	0	------	0	1	2	6	1	7	0	0	10
Cleveland	1	0	2	1	0	3	9	4	9	0	0	30
Columbus	2	0	------	0	0	0	1	0	11	0	0	3
Indiana:												
Fort Wayne	0	0	------	0	1	0	3	0	1	0	0	0
Indianapolis	2	0	------	1	3	1	5	0	7	0	0	24
South Bend	0	0	------	0	0	0	0	0	0	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	1	0	1	0	91	4	27	8	35	0	1	50
Springfield	0	0	------	0	0	0	3	0	1	0	0	0
Michigan:												
Detroit	2	0	------	1	19	1	9	1	24	0	0	32
Flint	0	0	------	0	20	0	1	0	6	0	0	4
Grand Rapids	0	0	------	0	0	0	1	0	5	0	0	2
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	3	0	0	0
Milwaukee	0	0	------	0	2	1	0	5	7	0	0	14
Racine	0	0	------	0	0	0	1	0	2	0	0	4
Superior	0	0	------	0	2	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	0	0	1	0	5	0	0	1
Minneapolis	2	0	------	0	1	0	4	1	2	0	0	7
St. Paul	0	0	------	0	0	2	6	0	2	0	1	5
Missouri:												
Kansas City	0	0	------	1	1	0	8	0	7	0	0	0
St. Joseph	0	0	------	0	1	0	0	0	1	0	0	0
St. Louis	0	0	1	0	0	4	9	18	11	0	2	4

See footnotes at end of table.

City reports for week ended October 27, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	0	0	1	0	0	1	1	0
Nebraska:												
Omaha	0	0		0	0	0	3	2	4	0	0	0
Kansas:												
Topeka	0	0		0	0	0	2	0	7	0	0	0
Wichita	0	0	1	0	1	1	4	0	8	0	0	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	1	0		0	0	0	2	0	0	0	0	0
Maryland:												
Baltimore	11	0		0	2	0	8	0	12	0	0	39
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0	1	1	3	1	8	3	13	0	3	11
Virginia:												
Richmond	1	0	1	1	0	0	3	8	11	0	1	2
Roanoke	2	0		0	0	0	1	0	0	0	0	0
West Virginia:												
Wheeling	0	0		0	0	0	3	0	1	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	2	0	2	0	0	[illegible]
Wilmington	2	0		0	0	0	4	2	6	0	0	[illegible]
Winston-Salem	1	0		0	0	0	1	0	4	0	0	1
South Carolina:												
Charleston	0	0	23	1	0	0	0	1	0	0	0	[illegible]
Georgia:												
Atlanta	5	0	4	0	0	0	4	0	5	0	2	[illegible]
Brunswick	0	0		0	0	0	0	0	1	0	0	[illegible]
Savannah	0	0		0	0	0	1	0	1	0	0	[illegible]
Florida:												
Tampa	1	0		0	0	0	1	0	0	0	0	[illegible]
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	3	0	1	0	0	0	15	1	3	0	0	[illegible]
Nashville	1	0		0	0	0	8	1	3	0	0	[illegible]
Alabama:												
Birmingham	2	0	3	0	0	0	6	1	3	0	1	[illegible]
Mobile	0	0		0	0	0	0	0	2	0	0	[illegible]
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	0	0	0	0	0	[illegible]
Louisiana:												
New Orleans	0	0	2	1	0	0	6	6	7	0	2	[illegible]
Shreveport	4	0		0	0	0	6	1	1	0	0	[illegible]
Texas:												
Dallas	5	0		0	2	1	6	0	10	0	0	[illegible]
Galveston	1	0		0	0	0	1	0	1	0	1	[illegible]
Houston	2	0		0	0	0	5	2	11	0	0	[illegible]
San Antonio	2	0	1	0	0	0	0	1	2	0	0	[illegible]
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	1	2	0	0	1	[illegible]
Great Falls	0	0		0	0	0	0	0	1	0	1	[illegible]
Helena	0	0		0	0	0	0	0	0	0	0	[illegible]
Missoula	0	0		0	10	0	0	0	0	0	0	[illegible]
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	[illegible]
Colorado:												
Denver	2	1	2	1	2	1	8	0	4	0	0	[illegible]
Pueblo	0	0		0	0	0	1	0	6	0	0	[illegible]
Utah:												
Salt Lake City	0	0		0	5	0	1	4	3	0	0	[illegible]

City reports for week ended October 27, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	2	39	0	5	0	15	0	0	6
Spokane	0	0	------	0	1	0	2	0	1	0	0	6
Tacoma	1	0	------	0	31	0	0	0	1	0	0	4
California:												
Los Angeles	3	0	8	0	8	0	2	3	39	0	0	25
Sacramento	0	0	------	0	4	1	1	0	2	0	0	7
San Francisco	3	0	------	0	39	1	4	1	14	0	0	10
Total	85	1	59	14	362	37	332	136	530	1	28	619
Corresponding week, 1944	105	------	43	23	205	------	333	------	589	0	24	468
Average, 1940–44	85	------	64	[1] 21	[2] 361	------	[1] 327	------	579	0	21	387

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: Providence, 1; New York, 4; Philadelphia, 1; Cleveland, 1; Chicago, 1; Spokane, 4; Los Angeles, 1; San Francisco, 1.
Dysentery, bacillary.—Cases: Boston, 1; Providence, 3; Buffalo, 1; New York, 7; Philadelphia, 1; Detroit, 4; Charleston, S. C., 3; Atlanta, 1; Memphis, 1; Denver, 1; Los Angeles, 4.
Dysentery, unspecified.—Cases: Cincinnati, 10; Baltimore, 1; Richmond, 1; San Antonio, 3.
Rocky Mountain spotted fever.—Cases: Buffalo, 1.
Tularemia.—Cases: Chicago, 1.
Typhus fever, endemic.—Cases: Atlanta, 16; Savannah, 3; Tampa, 2; Nashville, 1; Birmingham, 3; Shreveport, 1; Houston, 2; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 84 cities in the preceding table (estimated population, 1943, 34,018,300)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	3.0	0.0	0.0	0.0	105	9.0	72.1	57.1	141	0.0	0.0	102
Middle Atlantic	6.9	0.0	3.7	1.4	18	4.6	40.7	18.5	62	0.0	5.1	116
East North Central	6.7	0.0	1.8	1.8	85	7.3	40.1	11.6	72	0.0	0.6	106
West North Central	6.0	0.0	4.0	2.0	8	18.9	75.6	41.8	94	2.0	8.0	38
South Atlantic	40.7	0.0	49.2	5.1	8	1.7	64.5	23.7	95	0.0	10.2	95
East South Central	85.4	0.0	23.6	0.0	0	0.0	171.2	17.7	65	0.0	5.9	53
West South Central	40.2	0.0	8.6	2.9	6	2.9	68.9	28.7	92	0.0	8.6	6
Mountain	15.9	7.9	15.9	7.9	135	7.9	87.4	47.7	111	0.0	15.9	127
Pacific	14.2	0.0	12.7	3.2	193	3.2	22.1	6.3	114	0.0	0.0	92
Total	13.1	0.2	9.1	2.2	56	5.7	51.0	20.9	81	0.2	4.3	95

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 13, 1945.—During the week ended October 13, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		4		57	128	40	28	69	79	405
Diphtheria		10	1	51	1	3			1	67
Dysentery:										
Amebic					1					1
Bacillary									7	7
German measles				5	17		2	3	4	31
Influenza		18			13				7	38
Measles		1	1	40	85	2	1	2	104	236
Meningitis, meningococcus				1	5				1	7
Mumps		2		18	42	12	1	22	17	114
Poliomyelitis		4		3	[1] 13	1	4			[1] 25
Scarlet fever		8	17	110	60	20	9	22	16	262
Tuberculosis (all forms)			5	142	50	26	21	9	39	292
Typhoid and paratyphoid fever				16	3	1		1		21
Undulant fever				1	2					3
Venereal diseases:										
Gonorrhea		43	11	162	133	51	30	33	73	536
Syphilis		7	7	92	79	16	9	4	35	249
Whooping cough			3	138	10	3	1	5	1	161

[1] Includes 7 cases, delayed reports.

CUBA

Habana—Communicable diseases—4 weeks ended October 13, 1945.—During the 4 weeks ended October 13, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	13	1	Tuberculosis	4	2
Malaria	1		Typhoid fever	10	

Provinces—Notifiable diseases—4 weeks ended October 6, 1945.—During the 4 weeks ended October 6, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		2	6	13		18	39
Diphtheria	4	17	5			2	28
Hookworm disease		15					15
Leprosy		1	1	1		10	13
Malaria	24	2	5	3	2	96	132
Poliomyelitis						1	1
Tuberculosis	24	29	15	49	29	61	207
Typhoid fever	23	45	41	86	39	88	322
Undulant fever				1			1
Whooping cough				4			4

[1] Includes the city of Habana.

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Italy—Taranto.—Plague has been reported in Taranto, Italy, as follows: Week ended October 20, 1945, 1 case, 1 death; week ended October 27, 1 case.

Peru—Piura Department—Province of Huancabamba.—For the month of September 1945, 1 case of plague with 1 death was reported in the Province of Huancabamba, Piura Department, Peru.

Tunisia.—For the period September 21–30, 1945, 1 case of plague was reported in Tunisia.

Smallpox

Morocco (French).—For the period October 11–20, 1945, 115 cases of smallpox were reported in French Morocco, distributed by regions as follows: Agadir and frontier districts, 45; Casablanca, 30; Fez, 16; Marrakech, 11; Meknes, 13.

Typhus Fever

Chile.—For the period August 12 to September 8, 1945, 41 cases of typhus fever with 5 deaths were reported in Chile. Provinces reporting the highest incidence are as follows: Santiago, 17 cases, 4 deaths; Antofagasta, 7 cases; Concepcion, 6 cases.

Colombia—Bogota.—Information dated October 18, 1945, states that an outbreak of typhus fever has occurred in Bogota, Colombia, where 7 deaths have been reported during the past 2 weeks. It is stated that since the beginning of the year, 218 cases with 25 deaths have occurred.

Morocco (French).—For the period October 11–20, 1945, 155 cases of typhus fever were reported in French Morocco, including cases reported by regions as follows: Casablanca, 91; Fez, 1; Meknes, 56; Rabat, 7.

Yellow Fever

Venezuela—Merida State—Tovar District—Municipality of Mora—Quebradita.—Telegraphic information dated October 24, 1945, states that 1 confirmed case of yellow fever has occurred in Quebradita, Municipality of Mora, Tovar District, Merida State, Venezuela.

HEALTH SERVICE AREAS—REQUIREMENTS FOR GENERAL HOSPITALS AND HEALTH CENTERS [1]

A Review

Increasingly in recent years, spokesmen for hospital organizations and public health agencies have emphasized the need for integration of programs and facilities over areas sufficiently broad to render practical the extension of modern services to all sections of the population. Advantages to be derived from coordinating such facilities and programs, both within local districts and throughout wide regions, have been discussed in general terms, but only in limited areas have means been tried to relate specific activities of one institution with those of another. Now, in most of the States, commissions are confronted with the task of evaluating health needs and facilities and of devising more comprehensive and unified programs. To persons engaged in such undertakings and to those interested in the outcome, a recent bulletin issued by the United States Public Health Service, entitled "Health Service Areas—Requirements for General Hospitals and Health Centers," should prove both suggestive and helpful.

The authors emphasize the importance of appraising existing resources and of identifying areas of deficiency before embarking on a program of expansion. Using published data on hospital facilities and trading areas, they have developed a Nation-wide pattern of health service areas, in which counties are grouped into districts and districts into region within State boundaries. The focal point of each local grouping is usually the city or town with the largest number of general and allied special hospital beds. Within each region, the district hospital center apparently having the greatest service potentialities is selected as the primary center while others are designated as secondary. This theoretical network reflects the expressed belief of the authors in the need for an organized system linking small hospitals and health centers wherever they may be with larger hospitals, and then, with teaching and research centers. Such an arrangement should provide opportunities for the continuing education of professional and technical workers, as well as channels to appropriate institutions for referring patients who need highly specialized services.

Health centers are visualized for every significant rural community and urban neighborhood. To their more traditional functions is added that of furthering the coordination and development of hospital and public health services. A well-conceived program to wipe out deficits in hospital and health center facilities, the authors state,

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[1] Health Service Areas—Requirements for General Hospitals and Health Centers. By Joseph W. Mountin, Elliott H. Pennell, and Vane M. Hoge. Public Health Bulletin No. 292. Government Printing Office, 1945. For sale by the Superintendent of Documents, Washington 25, D. C. Price 25 cents.

would involve a planned sequence of construction. For illustrative purposes, they suggest a tentative scheme of priority ratings.

The outlines of health service areas are regarded primarily as patterns for use in measuring the distribution of current facilities and in estimating additional needs on a local area basis. Maps and extensive tabular material augment the usefulness of the bulletin for reference purposes. The maps, which are drawn on a common scale for each of the 48 States, show county boundaries and outlines of suggested local districts and regions, as well as the names and locations of designated district and regional hospital centers.

A series of tables follows, in which may be found the names of counties making up the various districts and regions, together with county, district, regional, and State totals for selected items pertinent to an evaluation of general hospital and health center needs. Data on population, buying income, land area, beds in general and special hospitals, and physicians are given for each county and are, therefore, available for use by persons who may wish to consider districts of different composition than those illustrated. Percentages and ratios showing relationships among the various factors mentioned are supplied for each district, region, and State.

Estimates, based on widely accepted standards, of the minimum number of new general and allied special hospital beds needed are submitted for each of the suggested hospital service districts and regions. Health centers needed are estimated by type for different population groups in each State. An additional feature is the "selected bibliography" in which are listed published articles, statements, and reports, by hospital, medical, and public health authorities, concerning the need for greater integration of health facilities or plans for achieving this end.

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UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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Public Health Reports

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THE TUBERCULOSTATIC ACTION OF STREPTOTHRICIN AND STREPTOMYCIN WITH SPECIAL REFERENCE TO THE ACTION OF STREPTOMYCIN ON THE CHORIOALLANTOIC MEMBRANE OF THE CHICK EMBRYO [1]

By E. W. Emmart, *Cytologist, United States Public Health Service*

Among the most recent of the tuberculostatic substances to be isolated from certain species of the actinomycetes are streptothricin obtained from *Actinomyces lavendulae* (*1*), and streptomycin produced by *Actinomyces griseus* (*2*). These two closely related substances (*3*) differ both in toxicity to animals (*4*, *5*, *6*) and in their tuberculostatic action on the human tubercle bacillus of the H 37 strain (*7*, *8*).

Using Long's synthetic medium and short periods of incubation, Woodruff and Foster (*9*) obtained inhibition in the growth of *Mycobacterium tuberculosis* (hominis 607) cultures with 1.0 unit per cc. or 100 units percent of streptothricin. In the present report we present the results of experiments (*a*) *in vitro* with streptothricin and streptomycin;[2] (*b*) on toxicity of the two drugs to the developing chick embryo; and (*c*) the tuberculostatic action of streptomycin as determined by the extent of tubercle development after the inoculation of the drug-bacillary suspension on the chorioallantoic membrane.

TUBERCULOSTATIC ACTION IN VITRO

The comparative tuberculostatic activity of streptomycin and streptothricin upon the human tubercle bacillus, A 27 strain, was studied *in vitro* in Kirchner's medium. The effects of various concentrations upon the growth of the pellicle were studied in triplicate and an average obtained for each concentration. Growth was

[1] From the Division of Physiology, National Institute of Health.

[2] The hydrochlorides of streptothricin and streptomycin were received through the courtesy of Merck & Co., Rahway, N. J.

evaluated from 0 to 4; 1 representing approximately three times the area of the original explant; 1.5 representing one-quarter of the surface of the culture medium; 2.0, half the surface of the culture medium; 3.0, three-quarters of the surface, and 4.0, the whole surface of the medium. Weekly observations were made on the comparative amount of growth and the experiments were terminated from 4 to 6 weeks after the beginning of incubation when the growth of the control cultures covered all or nearly all of the surface.

STREPTOTHRICIN

Two lots of streptothricin were used, the first having a potency of 370 units per milligram and the second 400 units per milligram.[3] In all experiments dilutions were expressed in units. Concentrations from 100 units percent to 2,500 units percent were used (table 1). Marked

TABLE 1.—*Tuberculostatic effect of streptothricin and streptomycin in Kirchner's medium*

Drug (units percent)	Average growth of A 27 strain from 3 flasks (evaluated from 0.0 to 4.0)		
	Streptothricin	Streptomycin	
	Lot 1, 370 units per mg. Lot 2, 400 units per mg.	Lot 1, 333 units per mg. Lot 4, 350 units per mg.	Lot 2, 100 units per mg. Lot 3, 120 units per mg.
6		4.0 (4)	3.6 (2, 3).
12		3.8 (4)	3.1 (2, 3).
25		2.1 (1, 4)	3.2 (2, 3).
50		1.2 (1, 4)	2.0 (2, 3).
100	4.0 (1)[1]	0.0 (1, 4)	1.1 (2, 3).
150		0.0 (4)	0.7 (3).
200	3.7 (1)	0.0 (4)	
250	2.1 (2)	0.0 (4)	0.0 (3).
500	1.6 (2)		
1,000	1.3 (2)		
1,500	1.2 (2)		
2,000	0.5 (1, 2)		
2,500	0.0 (2)		
Control	4.0	3.2	3.5.

[1] Figures in parentheses indicate lot number.

inhibition was obtained at 500 units percent with only negligible growth at 2,000 units percent.

STREPTOMYCIN

Four separate lots of streptomycin were used, differing in degree of purity with the following "unitage": Lot 1, 333 units per milligram; lot 2, 100 units per milligram; lot 3, 120 units per milligram; lot 4, 350 units per milligram. In all experiments with the various samples, dilutions (as with streptothricin) were expressed in units percent. The effect of dilutions between 6 and 250 units percent were studied in triplicate and the average recorded for each concentration.

[3] The unit has been defined as the amount of activity which inhibits the growth of *Bacillus coli* in 1 cc. of medium (7).

Under the experimental conditions no detectable differences were obtained between the 2 highly refined lots 1 and 4 having 333 units per milligram and 350.0 units per milligram, and between the 2 cruder preparations, lots 2 and 3 having 100 and 120 units per milligram. The average growth of the tubercle bacillus in these flasks has therefore been given in 2 groups (table 1). No inhibition could be obtained at 6 units percent; marked inhibition was attained at 50 units percent, and there was complete or nearly complete inhibition at 100 to 150 units percent. For detailed comparative analysis the average of all growth rates at the various concentrations of the 4 lots of streptomycin are shown in figure 1. At 50.0 units percent the inhibitory effect of lots 1 and 4 was greater than that of lots 2 and 3 which had a

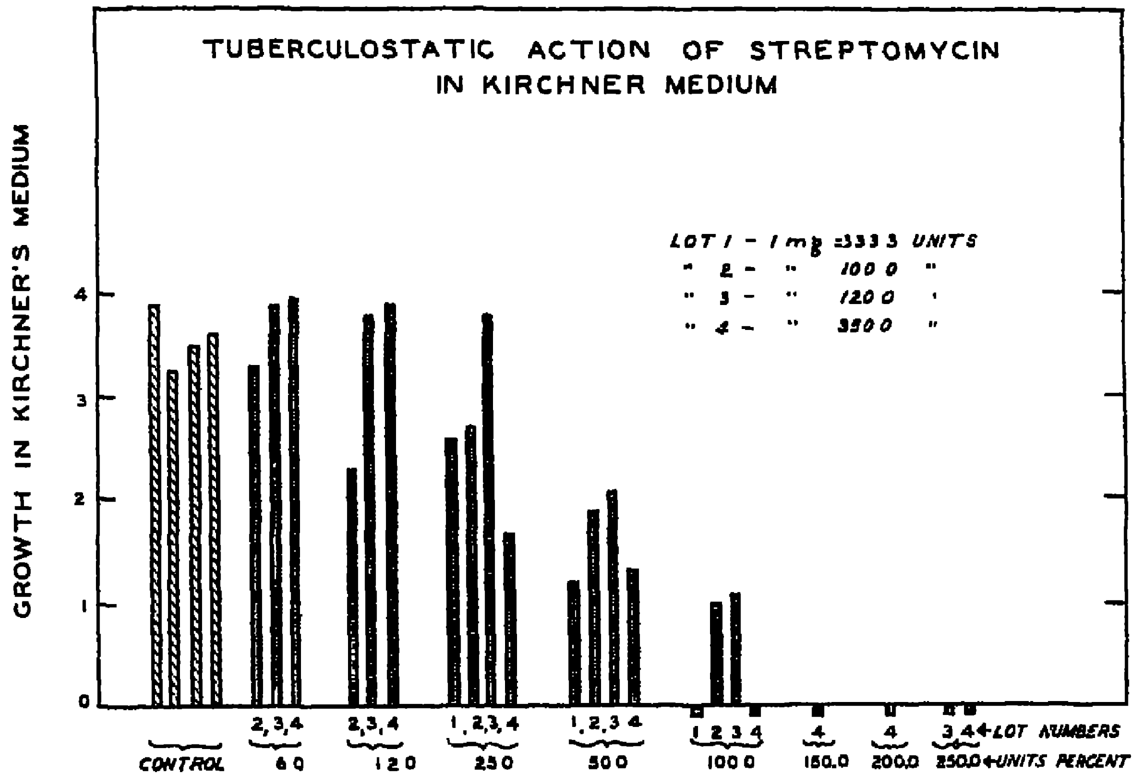

FIGURE 1.—Tuberculostatic action of streptomycin, showing the relative effectiveness of four different lots of streptomycin at various concentrations in Kirchner's medium.

lower "unitage" per milligram. Also, at 100 units percent the more highly refined preparations 1 and 4 gave complete inhibition, while 2 and 3 having only 100 and 120 units per milligram permitted some growth.

Comparing the tuberculostatic activity of streptomycin and streptothricin in Kirchner's medium, the experimental data indicate that under these conditions the more refined products of streptomycin gave complete inhibition at 100 units percent, while 2,500 units percent of streptothricin were required to give the same degree of inhibition. Lots 2 and 3 of streptomycin, of a lower degree of purification, gave complete inhibition at 250 units percent.

From the data given in table 1 it is seen that under the conditions of the experiment streptomycin is approximately 20 times more active

against the tubercle bacillus *in vitro* than streptothricin. The present data on streptomycin and streptothricin agree well with those given by Schatz et al. (*8*); the data for streptothricin are not in agreement with those given by Woodruff and Foster (*9*). The discrepancy is probably due to the fact that the latter worked with a rapidly growing strain of low virulence.

TOXICITY TO THE DEVELOPING CHICK EMBRYO

The toxicity of both streptothricin and streptomycin to the developing chick embryo was tested in various concentrations by dropping ⅛ cc. of the dissolved drug on the surface of the chorioallantoic membrane of the 8-day-old chick embryo. The dosages were measured with a 1-cc. tuberculin syringe and implanted on the surface of the membrane at the large end of the egg on the area of the membrane beneath the air sac. After 6 days the rate of survival was calculated for each concentration used. Table 2 gives the data for the two drugs obtained at the concentrations tested.

TABLE 2.—*Toxicity of streptomycin and streptothricin to the developing chick embryo*

Amount of drug (units)	Streptomycin				Streptothricin			
	Lot No.	Number of membranes inoculated	Number surviving	Percent survival	Lot No.	Number of membranes inoculated	Number surviving	Percent survival
50	1	12	11	91	1	12	9	91
100	1	12	10	83	1	11	10	90
250	1	18	15	83	----------	----------	----------	----------
278	----------	----------	----------	----------	2	33	7	46
500	1	12	9	75	1	12	11	9
1,000	1, 3	25	17	68	----------	----------	----------	----------
2,000	2, 3	74	7	9	----------	----------	----------	----------
4,357	2	27	0	0	----------	----------	----------	----------

Under the experimental conditions the differences in relative toxicity of the two drugs cannot be determined at dosage levels lower than 250 units. Dosages of 278 units of streptothricin gave 46-percent survival while dosages of 1,000 units of streptomycin gave 68-percent survival. This is approximately a ratio of toxicity of 1 to 3.6. The higher dosage of 500 units of streptothricin gave a mortality of 91 percent and it required 2,000 units of streptomycin to give the same mortality percent (table 2). Since streptothricin was approximately 4 times more toxic than streptomycin and streptomycin the more active drug *in vitro*, the latter was selected for further studies on the chick embryo.

TUBERCULOSTATIC ACTION OF STREPTOMYCIN IN THE CHORIOALLANTOIC MEMBRANE OF THE CHICK EMBRYO

In studying the inhibiting action of streptomycin upon the development of tubercles in the chorioallantois, the suspensions of bacilli

(strain A 27) were mixed with the drug varying in concentration from 1,250 to 7,500 units per cubic centimeter. The exposure of the bacilli to the action of the drug at 37.5° C. was at first limited to 24 hours. In 2 experiments a total of 50 eggs was inoculated in the experimental group and 48 in the control group; in the former group each egg received ⅕ cc., consisting of 250 units of the drug and 1 mg. of bacilli, while the latter received 1 mg. of tubercle bacilli only. In the survivors of the experimental group, the tubercles averaged 2.2 per membrane while in the control group they averaged 12.3. Analysis of the data shown in table 3 by the method of Croxton and Cowden (*10*) indicates a difference of statistical significance between the control and experimental groups.

Subsequent experiments were carried out with suspensions exposed for 48 hours' incubation to 250 and 500 units, respectively. The increase from 24 to 48 hours in time of exposure of the bacilli to the action of the drug did not greatly decrease the number of tubercles per membrane; nevertheless, in all experiments the average number of tubercles per membrane was consistently less in the experimental group than in the control group (fig. 2 and table 3). Four experiments were then carried out with 48-hour exposure of the bacilli to the action of 1,500 units of streptomycin per 0.2 cc. When all the data for the latter experiments were averaged, the mean tubercles per membrane for the experimental group was 1.2, while the mean for the control group was 29.7 (table 3). By using the formula referred to, the probability value is less than 1 in 1,000. This indicates that 1,500

TABLE 3.—*Tuberculostatic action of streptomycin in the chick embryo*

Units of drug	Lot No. of drug	Number of membranes inoculated	Number surviving	Percent survival	Average number of tubercles per membrane	P value [1]
(a) (After 24 hours exposure of bacilli to drug)						
250	1	50	32	64	2.2	<0.001
Control		48	28	58	12.3	
(b) (After 48 hours exposure of bacilli to drug)						
250	1	24	12	50	.8	<.01
Control		24	15	62	9.4	
500	1	30	17	56	1.4	<.001
Control		30	13	43	8.0	
1,500	2, 3	75	19	25	1.2	<.001
Control		75	30	40	29.7	

[1] Croxton, F. E. and Cowden, D. J. (*10*).

$$\sigma_{\bar{x}_1-\bar{x}_2}=\sqrt{\frac{(N_1+N_2)(\Sigma x_1^2+\Sigma x_2^2)}{N_1N_2[(N_1-1)+(N_2-1)]}}$$

units of streptomycin planted with 1 mg. of tubercle bacilli markedly inhibit tubercle development in the chorioallantois.

The differences in the size of tubercles and gross appearance of the membranes of the control and experimental groups are shown in figures 2 and 3. Microscopic examination of the sectioned membranes and analysis of the data by methods previously described (*11*, *12*) verified the gross observations both as to prevalence and size of the tubercles formed.

DISCUSSION

The results of the experiments *in vitro* using Kirchner's medium indicate that streptomycin is approximately 20 times more active than streptothricin. Approximately 0.3 mg. of the more highly purified samples of streptomycin per 100 cc. has been shown to be sufficient to give complete inhibition *in vitro*. Streptomycin is, therefore, much more active than the most active sulfone, 4,4′ diaminodiphenylsulfone, which was found to be inhibitory in a concentration of 2.0 mg. percent (*13*). This, together with the demonstrated tuberculostatic action of streptomycin on the chorioallantoic membrane, suggests that it might be effective against the tubercle bacillus in higher animals. Data on the action of streptomycin in experimental tuberculosis in guinea pigs are reported in a separate communication (*14*).

SUMMARY

1. Tests *in vitro* using Kirchner's medium have been carried out to determine the tuberculostatic effect of streptomycin and streptothricin.

2. The difference in toxicity of the two drugs for the developing chick embryo has been determined.

3. The inhibitory effect of streptomycin on the development of tubercles in the chorioallantoic membrane following incubation of bacilli with the drug at 37.5° C. for 24 and 48 hours has been established.

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CONTROL | TREATED

1 mg. T. B. (A 27 strain) | 250 units per 1 mg. T. B. for 48 hours

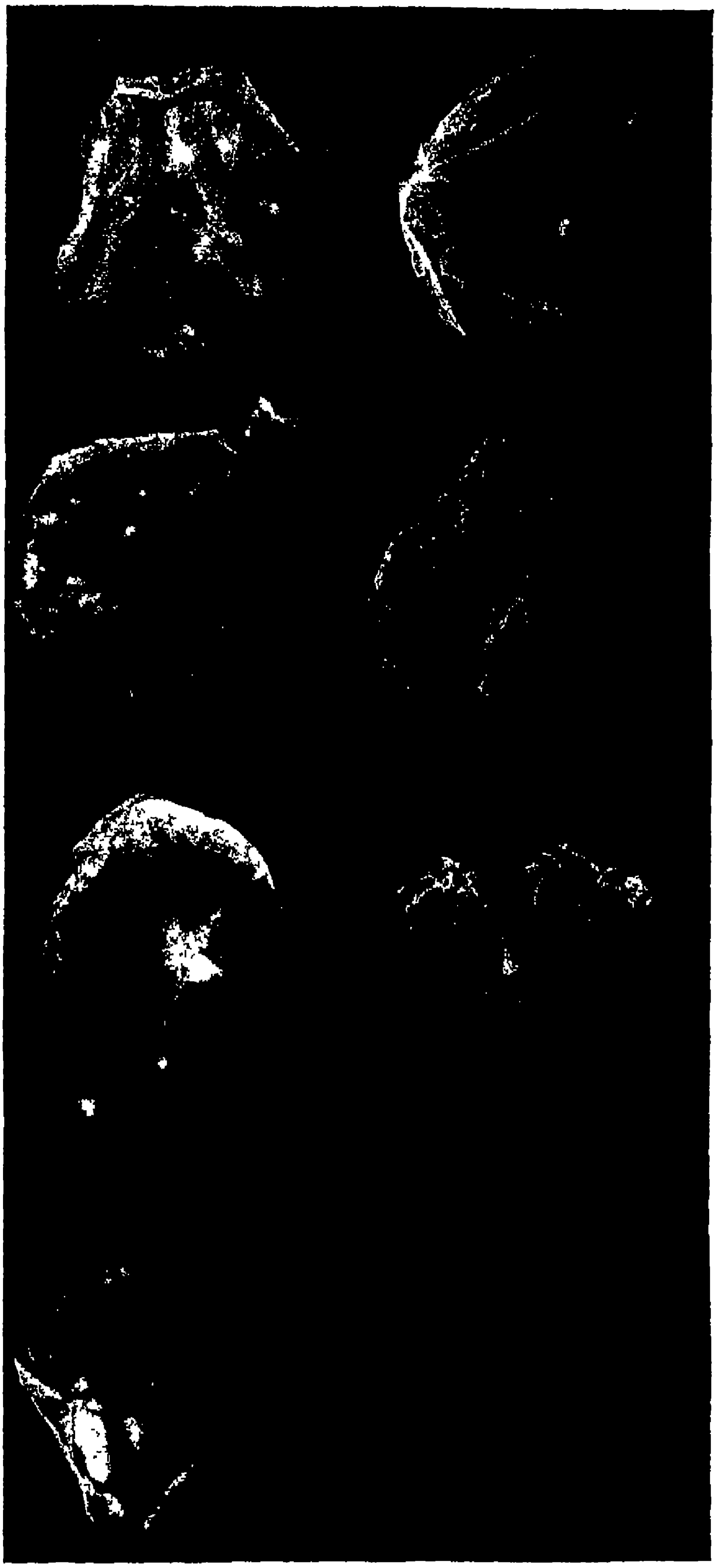

FIGURE 2.—Chorioallantoic membranes of the chick embryo, showing the difference in size and number of tubercles in the membranes of the control and experimental groups. In the experimental group the tubercle bacilli had been exposed to 250 units of streptomycin per milligram of bacilli for 48 hours before implantation.

CONTROL
1 mg. T. B. (A 27 strain)

TREATED
1,500 units per 1 mg. T. B. for 48 hours

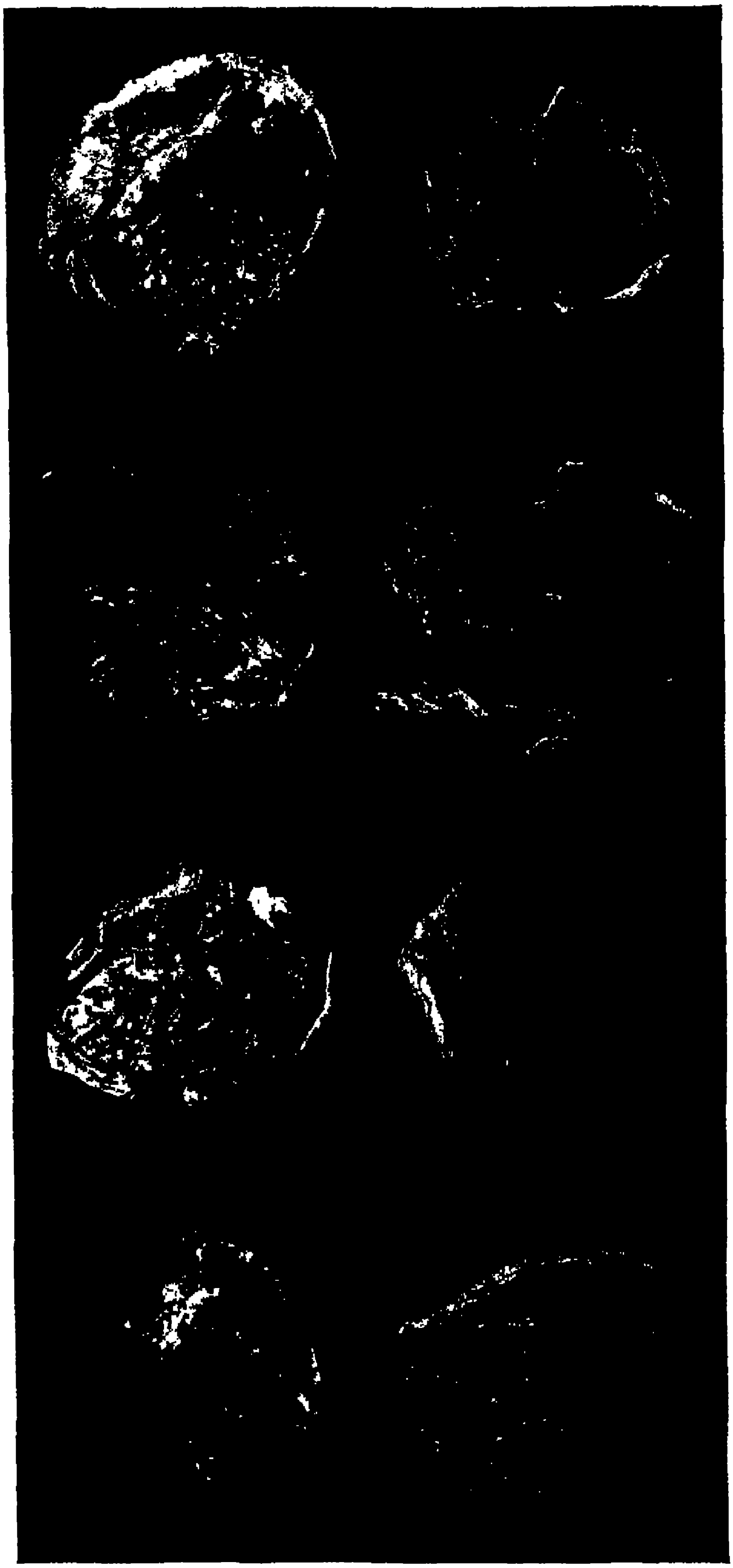

FIGURE 3.—Chorioallantoic membranes of the chick embryo, showing the difference in size and number of tubercles in the membranes of the control and experimental groups. In the experimental group the tubercle bacilli had been exposed to 1,500 units of streptomycin per milligram of bacilli for 48 hours before implantation.

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EPIDEMIOLOGICAL SIGNIFICANCE OF SEASONAL VARIATIONS IN RODENT-ECTOPARASITE DISTRIBUTION [1]

By A. S. Rumreich, *Senior Surgeon*, and Jean A. Koepke, *Assistant Statistician, United States Public Health Service*

In a classic study of the epidemiology of endemic typhus fever in the United States there was postulated the existence of a rodent reservoir of the disease with accidental transmission of infection from rats or mice to man by parasitic intermediaries such as fleas, mites, or possibly ticks (*1*). A later epidemiologic study eliminated the tick from consideration in this disease by a separation—on epidemiologic grounds confirmed and augmented by clinical observations—of a formerly undifferentiated disease complex composed of two rickettsial diseases into its components, viz, endemic typhus and Rocky Mountain spotted fever (*2*, *3*).

The virus of endemic (murine) typhus was readily recovered from fleas obtained from rats at epidemiologically established typhus foci in several widely separated localities in the United States (*4*, *5*, *6*, *7*). It was later demonstrated experimentally that all fleas, so far tested, found on rats are infectible, and transmission from animal to animal has been effected with several species (*8*, *9*, *10*, *11*, *12*, *13*). A demonstrated mechanism of transmission is the rubbing of crushed infected fleas into the abraded skin (*14*). Human transmission experiments with fleas have not been successful (*15*). In animal experiments the infection was not transmitted by the mite *Echinolaelaps echidninus* (*16*), but was transmitted by the tropical rat mite *Liponyssus bacoti* (*17*) and by the rat louse *Polyplax spinulosa* (*16*).

[1] From the Division of Public Health Methods.

One of the objectives of previously described multilocular field studies of the ectoparasites of rodents and other animals was the procurement of data that might serve as evidence, admissible and acceptable from the epidemiologic standpoint, bearing on the relative importance, under natural conditions, of the several experimentally demonstrated vectors of endemic typhus (*18*).

The purpose of the present report is to assemble some of the significant findings of the first three of these field studies to be tabulated, viz, those made in Jacksonville, Fla., Mobile, Ala., and Honolulu, T. H., with the thought that this brief compilation and analysis may serve to (*a*) test the validity of some accepted concepts, (*b*) demonstrate gaps in our knowledge that need to be bridged, and (*c*) point out anew the interdependence of the epidemiologic and laboratory phases of research in this field.

Identical techniques were used in all three cities in the collection of ectoparasites from live animals. These procedures have been described in the report on Jacksonville (*18*). Identifications were made in the Zoology Laboratory, National Institute of Health, of parasites obtained from the following numbers of rodents of the genus *Rattus:* 4,663 from Jacksonville, 6,123 from Mobile, and 6,382 from Honolulu. The numbers and classification of the parasites are given in table 1.

In the Jacksonville study it was found that only in the cases of two ectoparasites, *Xenopsylla cheopis* and *Laelaps hawaiiensis*, did the

TABLE 1.—*Ectoparasites of commensal rats*

	Jacksonville		Mobile		Honolulu	
	Number	Percent	Number	Percent	Number	Percent
Siphonaptera:						
X. cheopis	17,593	58.0	28,855	64.0	16,169	39.1
N. fasciatus	592	2.0	3,846	8.5	1	(1)
L. segnis	5,728	18.9	4,081	9.0	2	(1)
E. gallinacea	5,989	19.8	7,292	16.2	24,676	59.6
C. felis	405	1.3	992	2.2	539	1.3
All others	11	(1)	31	.1	15	(1)
Total	30,318	100.0	45,097	100.0	41,402	100.0
Acarina:[2]						
L. hawaiiensis	17,888	70.2	17,270	66.6	57,215	91.4
E. echidninus	4,334	17.0	7,330	28.3	5,031	8.1
L. bacoti	3,206	12.6	310	1.2	268	.4
All others	62	.2	1,010	3.9	57	.1
Total	25,490	100.0	25,920	100.0	62,571	100.0
Anoplura:[2]						
P. spinulosa	8,482	63.9	19,960	61.6	18,887	82.8
Hoplopleura	4,796	36.1	12,380	38.2	3,919	17.2
All others	------	------	50	.2	------	------
Total	13,278	100.0	32,390	100.0	22,806	100.0

[1] Less than 0.05.
[2] Numbers of Acarina and Anoplura in total host population sample estimated from 10 percent of sample.

biometric constants [2] show significant positive correlation with local temperature, and, in each instance, the prevalence of the parasite corresponded to the incidence of endemic typhus fever locally and in the surrounding region. The relationship between the prevalence of these ectoparasites on their animal hosts as expressed by specific biometric constants and the incidence of typhus fever as measured by reported human cases (tables 3, 4, and 5) is illustrated in figures 1 and 2, and expressed numerically in table 2. In the table comparisons

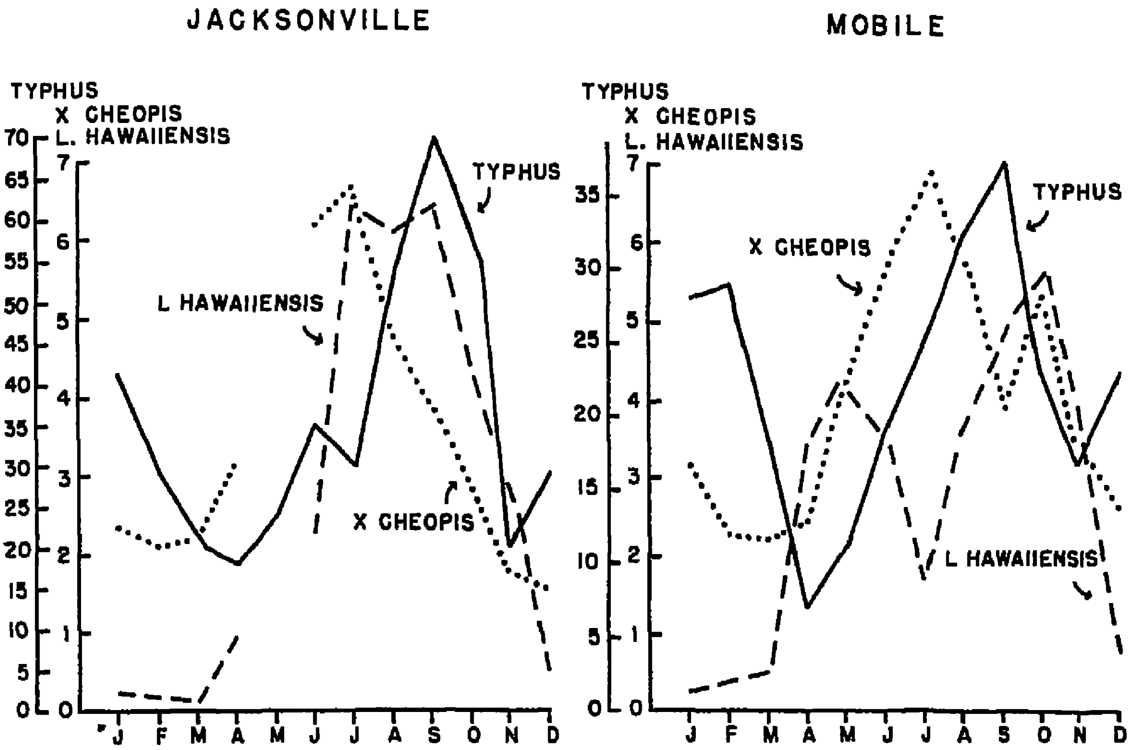

FIGURE 1.—(a) *X. cheopis* and *L. hawaiiensis* indices, Jacksonville, and reported typhus cases, Florida and Georgia, 1934. (b) *X. cheopis* and *L. hawaiiensis* indices, Mobile, and reported typhus cases, Alabama, 1934.

TABLE 2.—*Correlation coefficients (r), and corresponding probability values (P),*[1] *between monthly biometric constants of principal rodent ectoparasites and typhus fever cases reported in the same and in succeeding months*

	Jacksonville				Mobile				Honolulu			
	No case lag		1-month case lag		No case lag		1-month case lag		No case lag		1-month case lag	
	r	P	r	P	r	P	r	P	r	P	r	P
X. cheopis mean	0.244	0.470	0.614	0.045	0.036	0.912	0.694	0.012	−0.758	0.004	−0.337	0.285
X. cheopis index	.287	.392	.638	.035	.227	.479	.740	.006	−.792	.002	−.460	.133
X. cheopis infestation	.532	.092	.723	.012	.521	.083	.787	.002	−.857	<.001	−.525	.080
L. hawaiiensis mean	.426	.192	.782	.004	−.067	.836	.186	.674	.451	.141	.183	.569
L. hawaiiensis index	.682	.021	.824	.002	−.111	.732	.135	.676	.516	.086	.230	.473
L. hawaiiensis infestation	.667	.025	.708	.015	−.016	.961	.107	.741	.468	.125	.503	.096

[1] P expresses the probability of obtaining by chance an r of the given magnitude (or larger) if the true correlation is zero.

[2] The mean used here is the arithmetic mean or average number of ectoparasites per live animal host. The index is derived by the π limiting function method, described in the Jacksonville report (*18*). The infestation rate is the percentage of live animals parasitized.

are made (*a*) with typhus cases reported in the same month as that for which ectoparasite constants were calculated, and (*b*) with typhus cases reported during the following month. This use of a time lag is an endeavor to take into account the incubation period of endemic typhus fever in man plus the interval elapsing between onset of illness and date of report. Evidence as to the average or the modal length

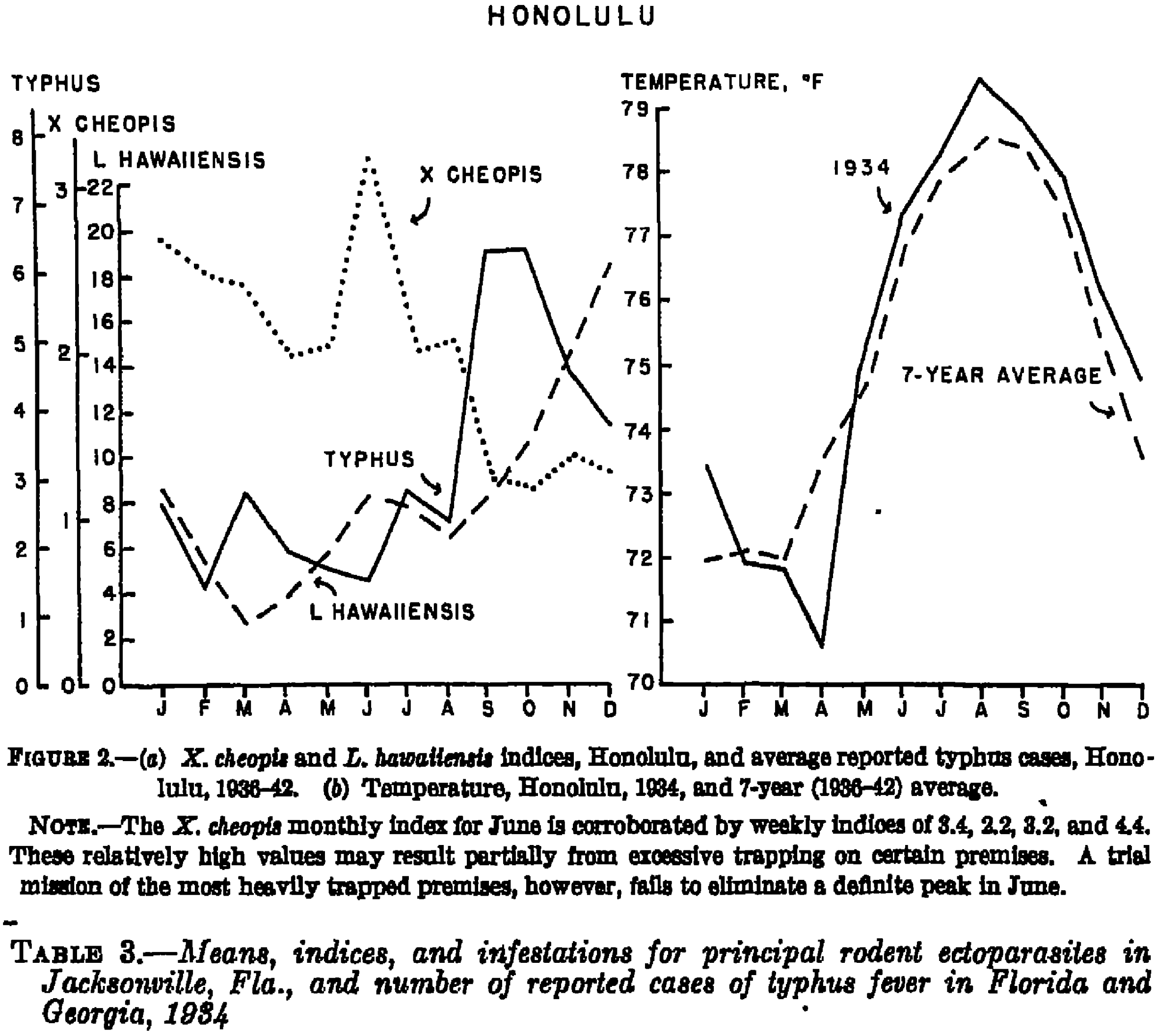

FIGURE 2.—(*a*) *X. cheopis* and *L. hawaiiensis* indices, Honolulu, and average reported typhus cases, Honolulu, 1936–42. (*b*) Temperature, Honolulu, 1934, and 7-year (1936–42) average.

NOTE.—The *X. cheopis* monthly index for June is corroborated by weekly indices of 3.4, 2.2, 3.2, and 4.4. These relatively high values may result partially from excessive trapping on certain premises. A trial mission of the most heavily trapped premises, however, fails to eliminate a definite peak in June.

TABLE 3.—*Means, indices, and infestations for principal rodent ectoparasites in Jacksonville, Fla., and number of reported cases of typhus fever in Florida and Georgia, 1934*

Month	Number of rats	*Xenopsylla cheopis*			*Laelaps hawaiiensis* [1]			Reported typhus cases	
		Mean number per rat	Index [2]	Infestation (percent)	Mean number per rat	Index [2]	Infestation (percent)	Florida	Georgia
January	709	2.75	2.41	59.5	0.21	0.21	8.4	3	38
February	675	2.50	2.11	55.4	.15	.15	10.3	0	29
March	351	2.27	2.24	57.0	.06	.06	5.7	0	20
April	512	3.48	3.01	68.9	.91	.91	24.5	1	17
May	------	------	------	------	------	------	------	4	20
June	263	7.30	6.20	87.8	2.26	2.26	51.6	3	32
July	484	7.47	6.51	92.2	13.39	6.38	65.6	3	27
August	455	5.32	4.73	85.3	7.48	6.12	77.6	6	48
September	313	4.12	3.89	84.7	6.83	6.42	70.7	3	67
October	320	3.41	3.26	78.4	5.62	4.75	70.0	10	45
November	302	1.98	1.90	61.9	2.31	2.31	40.0	1	19
December	279	1.58	1.56	60.2	.57	.57	32.1	1	28

[1] Biometric constants for *L. hawaiiensis* are based on a 10-percent sample of trapped live rats.

[2] The index is derived as is the mean except that excessively high counts are limited to a value π obtained as described in (*18*). In the case of *X. cheopis* the frequency distribution was reduced to a percentile basis before computing π.

TABLE 4.—*Means, indices, and infestations for principal rodent ectoparasites in Mobile, Ala., and number of reported cases of typhus fever in Alabama, 1934*

Month	Number of rats	*Xenopsylla cheopis*			*Laelaps hawaiiensis* [1]			Reported typhus cases, Alabama
		Mean number per rat	Index [2]	Infestation (percent)	Mean number per rat	Index [2]	Infestation (percent)	
January	288	4.58	3.63	70.8	0.18	0.18	14.3	28
February	1,000	2.68	2.26	52.6	.32	.32	10.0	29
March	875	2.64	2.23	50.3	.47	.47	13.6	19
April	422	4.34	2.36	44.8	3.33	3.33	42.9	7
May	411	6.09	4.11	66.7	4.17	4.17	39.0	11
June	580	7.58	5.84	76.0	3.72	3.40	27.6	19
July	271	9.38	6.86	79.0	1.74	1.74	18.5	25
August	473	6.96	5.49	80.8	4.23	3.45	46.8	33
September	504	4.41	3.87	77.2	5.02	4.80	56.9	37
October	492	6.15	5.28	79.1	7.71	5.49	55.1	23
November	453	3.99	3.56	65.8	4.84	3.71	51.1	17
December	354	2.61	2.53	55.1	.67	.67	22.2	23

[1] See footnote 1, table 3.
[2] See footnote 2, table 3.

of the former is meager, but on the basis of limited data is thought to be about 10 days; the latter is conditioned by the prominent role of the laboratory diagnoses which are not as a rule available until after the first week; in a series of 50 histories of cases in Savannah, Ga., the average interval between onset of the disease and report of the case was 12.9 days.

Because of the small number of typhus cases recognized and reported in the State of Florida in 1934, the cases reported in that year in the State of Georgia have been added to the former and the totals utilized for comparative purposes. For the same reason, in the case of Mobile the typhus cases reported in Alabama, and concentrated in the southern part of the State, have been used. In Honolulu, typhus was not reported prior to the summer of 1935; hence, an average has been taken of the cases reported for that city during the 7-year period

TABLE 5.—*Means, indices, and infestations for selected rodent ectoparasites in Honolulu, T. H., 1934, and average number of reported cases of typhus fever in Honolulu, 1936–42*

Month	Number of rats	*Xenopsylla cheopis*			*Laelaps hawaiiensis* [1]			Reported typhus cases, Honolulu, 7-year average
		Mean number per rat	Index [2]	Infestation (percent)	Mean number per rat	Index [2]	Infestation (percent)	
January	638	3.23	2.77	57.8	10.84	8.08	75.0	2.71
February	611	3.03	2.58	59.6	4.80	4.80	67.2	1.57
March	639	3.21	2.49	60.9	2.80	2.80	42.2	2.83
April	540	2.76	2.04	56.3	3.72	3.72	57.4	2.00
May	607	2.43	2.08	58.5	5.64	5.64	75.4	1.71
June	498	4.33	3.27	69.9	11.24	8.18	92.0	1.57
July	416	2.19	2.07	63.9	7.83	7.83	88.1	2.86
August	407	2.92	2.13	55.5	6.76	6.76	84.8	2.43
September	266	1.68	1.31	42.5	9.67	8.90	89.6	6.43
October	586	1.40	1.25	41.3	10.47	10.47	94.9	6.43
November	601	1.56	1.41	43.9	15.52	14.63	90.0	4.71
December	578	1.35	1.30	44.5	18.89	17.98	98.0	3.86

[1] See footnote 1, table 3.
[2] See footnote 2, table 3.

1936–42 (table 6), 1936 having been the first complete year of reporting, and 1942 the last year in which reports were issued consistently by months. It is known that in Florida during 1934 there occurred cases of unrecognized typhus fever,[3] and, in the absence of evidence to the contrary, it would seem reasonable to assume that an analogous situation obtained in Hawaii. As it is virtually axiomatic that the incidence of insect-borne diseases is directly related to the prevalance of vectors, and that vector prevalence is in turn related to climatic conditions, a graphic comparison has been made of the temperature in

TABLE 6.—*Reported typhus fever in Honolulu, 1936–42* [1]

Month	1936	1937	1938	1939	1940	1941	1942
January	0	5	2	1	1	2	8
February	0	0	1	1	3	0	6
March	7	1	1	1	3	1	6
April	0	1	0	0	5	7	1
May	1	0	3	1	1	3	3
June	0	0	2	1	3	3	2
July	3	4	3	3	1	1	5
August	3	1	3	2	2	3	3
September	7	2	4	12	2	14	4
October	12	4	5	6	1	13	4
November	7	1	8	2	4	9	2
December	2	1	7	6	2	4	5
Total	42	20	39	36	28	60	49

[1] For 1940–42, reports are designated as for Territory of Hawaii.

Honolulu in 1934 with that of the 7-year period during which typhus was systematically reported. This comparison, illustrated in figure 2, indicates a fairly close correspondence between the temperatures in the two periods. This impression is corroborated by a correlation coefficient of 0.931 ± 0.042 ($P = < 0.001$) between the two sets of temperature data.

It will be noted that statistically significant positive correlation obtains between biometric constants for *X. cheopis* in Jacksonville and reported typhus fever cases in Florida and Georgia, but only when a 1-month typhus case lag is used. The *L. hawaiiensis* index and infestation correlate significantly with typhus cases without case lag, but with a 1-month case lag this statistical significance is enhanced, and extends to the mean. Numerically the populations of the two parasites are nearly equal.

Significant correspondence between *X. cheopis* prevalence in Mobile and typhus fever in Alabama is demonstrable only with the use of the 1-month typhus case lag period. The *L. hawaiiensis* correlation is practically nil. The numerical ratio between *X. cheopis* and *L. hawaiiensis* is 1.7:1.

The findings in Honolulu are completely at variance with the foregoing. *X. cheopis* prevalence does not correspond with average typhus

[3] Personal observation of senior author.

incidence; in fact, the correlation between the two is consistently negative. Correlations of *L. hawaiiensis* with typhus are positive but do not attain statistical significance. *L. hawaiiensis* outnumbers *X. cheopis* by 3.5:1.

DISCUSSION

It is a generally accepted epidemiologic concept that variations in the size and composition of the ectoparasite population infesting the rodent population play a major role in determining the geographic and seasonal distribution of endemic typhus. Consequently, an ectoparasite may be experimentally infectible, or capable of transmitting infection, or found to be infected in nature, and yet be excluded from consideration as an important vector of the disease either because of numerical paucity or of seasonal or geographic distribution at variance from that of the disease. For example, *L. bacoti* is an experimentally proven vector, but was found in too small numbers in Mobile and in Honolulu, and in too erratic and contraseasonal a distribution in Jacksonville, to have served as an important vector in those cities during the period of the study.

Such conclusions as may be derived from the data presented above must be assessed with cognizance of certain inescapable imperfections in the materials available for analytic study. The difficult circumstances attending the execution of the large-scale study, of which this report represents a small part, were mentioned in the report on the Jacksonville study. The necessity for extrapolations, such as the utilization of morbidity reports from an area surpassing in extent that surveyed for parasites, or from a noncontemporaneous period, was largely occasioned by the fact that the clinical recognition and laboratory diagnosis of typhus were not as general at that time as they now are. With this reservation, the following statements are made.

In the light of the known infectibility of *X. cheopis*, together with the field survey findings here reported, this common ectoparasite of the commensal rats may be accepted as at least an important vector in Jacksonville and as the principal vector in Mobile. The available evidence is not adequate, however, to support any assumption that this rat flea plays an equivalent role in Honolulu. On the other hand, the suggestive correspondence to statistically significant correlation of the parasitid mite *L. hawaiiensis* with typhus fever cannot be considered as evidence of any role in transmission, since the only known observations on this mite have been limited to taxonomic studies of killed specimens. Incrimination of this mite as a vector in some localities or during certain periods would be contingent upon demonstration of its infectibility either in nature or under experimental conditions.

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FIVE-POINT NATIONAL HEALTH PROGRAM PROPOSED BY PRESIDENT TRUMAN[1]

On November 19 the President sent to the Congress a special message proposing a 5-point national health program.

The President points out that millions of our citizens do not have a full opportunity to achieve or enjoy good health; millions do not

[1] Official White House press release. The complete text of the President's message may be found in H. Doc 380, dated Nov. 19, 1945, obtainable from the Superintendent of Documents, Washington 25, D. C.

have protection against the economic effects of sickness. Even prewar, there were 31 counties in the United States each with more than 1,000 inhabitants in which there were no practicing physicians. About 1,200 counties, with some 15,000,000 inhabitants have either no local hospital or none that meets even the minimum standards of national professional associations.

Selective Service had to reject 5,000,000 young men, or one-third of those examined. An additional 3,000,000 had to be discharged or rehabilitated.

In his message, the President reviews the main problems and needs, and he submits a 5-point program for legislative action:

Recommendation 1. Construction of hospitals and related facilities.—Federal aid should be provided for construction of hospitals, health centers, and other facilities where they are needed. These are essential if doctors are to be able to furnish modern services.

Recommendation 2. Expansion of public health, maternal, and child-health services.—The existing cooperative health programs between the Federal and State Governments should be expanded with the help of increased Federal funds. All parts of the country and all groups in the population should be able to benefit from them. Expansion is especially important to prevent disease and to provide services for mothers and children. Approximately 40,000,000 persons in the United States live in communities which still lack full-time public health services.

Recommendation 3. Medical education and research.—We cannot remain satisfied with what we already know about health or disease. The opportunities for further health progress are very large. Research pays large dividends. Professional education should keep pace with progress. Federal grants in aid should assist and encourage research, so that we shall learn more about how to prevent and cure disease. Federal aid should also support more adequate professional education. Special emphasis should be paid to research on the cause, prevention, and cure of cancer and mental illnesses.

Recommendation 4. Prepayment of medical costs.—Everyone should have ready access to all necessary medical, hospital, and related services. The costs of essential medical services should not stand in the way of the patient who needs care.

A compulsory national health insurance system is proposed toward attaining this goal. It would be a system for prepayment of the costs through premiums which people could afford, and which are paid while they are well and working.

This is *not* socialized medicine.

Prepayment would relieve families of worry about medical costs and would encourage them to receive care as soon as it is needed. Thus, it would also work toward preventing serious disease.

Patients would remain free to choose their doctors. Doctors would remain free to accept or reject patients. Hospitals would continue to manage their own services. Voluntary organizations could participate in the insurance system, either to provide services and be paid therefor, or to assist in administration, depending on their functions.

Decentralized administration would provide for needed local adjustments in fees, methods of payment, and arrangements for services.

Doctors and hospitals could expect improvement and stability of income, at the same time that patients are relieved of unexpected and burdensome costs.

Recommendation 5. Protection against loss of wages from sickness and disability.—Disability insurance would protect America's families by guaranteeing some income when they are sick or permanently disabled.

The President urged the Congress to consider such health legislation now. This 5-point program would strengthen the Nation to meet future problems. It would contribute greatly to freedom from want.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

October 7–November 3, 1945

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the Public Health Reports under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended November 3, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

DISEASES ABOVE MEDIAN PREVALENCE

Diphtheria.—For the 4 weeks ended November 3 there were 2,809 cases of diphtheria reported as compared with 1,937 for the corresponding period in 1944. The 1940–44 median is represented by the 1944 figure. Each section of the country except the Middle Atlantic contributed to the relatively high incidence of this disease. The largest increases over the preceding 5-year medians were reported from the South Atlantic and East South Central sections. For the country as a whole the current incidence is the highest during this period since 1939 when 3,219 cases were reported.

Meningococcus meningitis.—An increase of this disease is normally expected at this season of the year, but there were only 331 cases reported during the 4 weeks ended November 3 as compared with 359 cases during the preceding 4 weeks. The number of cases was about 50 percent of the incidence for the corresponding period in 1944 (627 cases); the 1940–44 median was 237 cases. The disease was still relatively high in the East North Central, West North Central, West South Central, and Pacific sections, low in the New England and South Atlantic sections, and about normal in the Middle Atlantic, East South Central, and Mountain sections.

Influenza.—A total of 8,390 cases of influenza was reported for the current 4-week period. The number was 1.6 times the 1940–44 median for this period. Of the total cases Texas reported 4,525; South Carolina, 1,766; and Virginia, 683 cases; more than 80 percent

Number of reported cases of 9 communicable diseases in the United States during the 4-week period October 7–November 3, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	2,809	1,987	1,987	8,390	5,629	5,404	4,682	2,188	5,283
New England	32	27	25	48	70	17	698	349	851
Middle Atlantic	101	94	132	29	31	42	698	255	926
East North Central	274	165	230	162	97	187	867	224	702
West North Central	137	154	128	25	23	39	137	86	297
South Atlantic	998	418	610	2,610	1,688	1,612	235	114	191
East South Central	553	334	334	236	118	136	153	28	158
West South Central	471	482	432	4,918	3,294	2,482	183	170	170
Mountain	65	75	57	805	264	396	485	101	413
Pacific	178	188	128	57	94	157	1,221	861	632
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	331	627	237	2,045	2,464	1,555	9,009	8,492	8,492
New England	18	44	31	164	136	70	540	715	715
Middle Atlantic	83	168	85	436	1,097	155	1,264	1,281	1,281
East North Central	74	154	27	520	429	319	2,133	1,966	2,347
West North Central	33	57	11	255	218	165	815	899	963
South Atlantic	27	68	39	146	341	197	1,602	1,293	1,293
East South Central	20	33	19	111	71	58	670	555	663
West South Central	29	37	8	125	38	50	683	450	350
Mountain	10	9	7	90	17	19	345	467	257
Pacific	37	57	26	198	117	103	957	866	528
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	16	19	36	423	407	598	7,536	6,019	10,795
New England	0	0	0	23	23	25	929	666	926
Middle Atlantic	0	0	0	71	65	76	2,238	1,835	2,856
East North Central	1	7	7	43	35	95	1,627	1,202	2,782
West North Central	5	0	7	22	18	22	191	416	679
South Atlantic	0	0	0	83	76	120	918	966	1,194
East South Central	7	1	3	66	42	63	257	149	396
West South Central	2	0	7	71	90	99	426	621	529
Mountain	0	11	2	26	27	42	259	255	292
Pacific	1	0	0	18	31	30	646	409	892

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

of the cases were reported from those three States. In other sections of the country the situation was favorable, slight or no increases over the median being reported.

Poliomyelitis.—The number of cases of poliomyelitis dropped from 3,198 during the preceding 4 weeks to 2,045 during the 4 weeks ended November 3. The number of cases was about 80 percent of the number reported for the corresponding weeks in 1944; but it was 30 percent above the 1940–44 median. The decline from the 1944 figure was due to a decrease of about 60 percent in the cases in the Middle Atlantic and South Atlantic sections; in every other region the incidence was higher than in 1944. The incidence was above the 5-year median in all sections except the South Atlantic. While the decline of this disease has been slow in some parts of the country, weekly reports indicate that a decline is in progress in all sections and may continue, since the lowest incidence of poliomyelitis is reached during the winter months.

Scarlet fever.—The number of cases of scarlet fever was slightly above the normal seasonal expectancy, 9,009 cases being reported for the current 4 weeks as compared with a 1940–44 median of 8,492 cases. The increase was largely due to an excess of cases in the South Atlantic, West South Central, Mountain, and Pacific regions. In the other 5 sections of the country the incidence either closely approximated the median or fell below it.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—For the 4 weeks ended November 3 there were 4,682 cases of measles. The number was 2.1 times that reported for the corresponding period in 1944, but it was less than 90 percent of the 1940–44 median. Each geographic section of the country reported an increase over the 1944 incidence, but the most significant increase over the preceding 5-year median was reported from the Pacific section. In that section the number of cases (1,221) was almost twice the median, while in other sections the incidence either closely approximated the median or fell below it.

Smallpox.—The number of cases (16) of smallpox was the lowest on record for this period of the year. In the East South Central section, where 7 of the cases occurred, the incidence was above the seasonal expectancy, but in all other sections the incidence was either about normal or relatively low.

Typhoid and paratyphoid fever.—The number of cases (423) of typhoid fever was slightly above the incidence for the corresponding period in 1944, but it was only about 70 percent of the 1940–44 median. Several sections of the country reported slight increases over the 1944 figures, but only one section, the East South Central, reported an increase over the preceding 5-year median. The most significant decline

was reported from the East North Central section where the incidence was about 50 percent below the normal seasonal expectancy.

Whooping cough.—For the current 4-week period, 7,536 cases of whooping cough were reported, as compared with 6,017 for the corresponding period in 1944 and a 5-year median of 10,795 cases. The Middle Atlantic and East North Central sections reported the largest increases over the 1944 figures, but minor increases were reported in the New England, East South Central, and Pacific sections. The incidence in the New England section stood at the normal seasonal level, but in all other sections it was below the normal seasonal expectancy.

MORTALITY, ALL CAUSES

For the 4 weeks ended November 3 there were 35,648 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding weeks in 1942–44 was 34,893 deaths. During the second and fourth weeks of the 4-week period the numbers of deaths were 7.7 percent and 3.1 percent, respectively, above the averages for the corresponding weeks in the 3 preceding years. In the first week the increase was less, and during the third week the number of deaths was below the average. The number of deaths for the 4 weeks was only 2.2 percent more than the 3-year average.

DEATHS DURING WEEK ENDED NOVEMBER 3, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 3, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	9,023	8,968
Average for 3 prior years	8,752	
Total deaths, first 44 weeks of year	393,890	395,193
Deaths under 1 year of age	598	671
Average for 3 prior years	644	
Deaths under 1 year of age, first 44 weeks of year	26,696	27,340
Data from industrial insurance companies:		
Policies in force	67,291,994	66,865,613
Number of death claims	12,254	12,864
Death claims per 1,000 policies in force, annual rate	9.5	10.1
Death claims per 1,000 policies, first 44 weeks of year, annual rate	10.1	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 10, 1945

Summary

A total of 330 cases of poliomyelitis was reported as compared with 390 last week, 314 for the corresponding week last year, and a 5-year (1940–44) median of 243. Decreases occurred in all of the 9 geographic areas except the East North Central and the Pacific, but slight increases occurred in 6 of the 9 States reporting 10 or more cases each, as follows (last week's figures in parentheses): *Increases*—Pennsylvania 19 (13), Illinois 31 (30), Wisconsin 53 (43), Minnesota 10 (8), Washington 13 (4), California 44 (36); *decreases*—Massachusetts 14 (20), New York 34 (41), Iowa 12 (18). The total to date is 12,672 cases, as compared with 18,202 last year and 11,622 in 1943 for the corresponding period, in which years approximately 94 percent of the yearly total had been reported.

A total of 104 cases of meningococcus meningitis was reported as compared with 88 last week, and a 5-year median of 69. Only 4 States reported more than 4 cases, as follows (last week's figures in parentheses): New York 16 (15), Pennsylvania 11 (4), Illinois 12 (7), California 12 (7). The total to date is 7,207, as compared with 14,781 and 15,796 for the corresponding periods of 1944 and 1943, respectively, and a 5-year median of 3,039.

Following the usual seasonal trend, the incidence of diphtheria declined for the second consecutive week. A total of 645 cases was reported, a larger number than reported for a corresponding week since 1939. The median for the corresponding weeks of the past 5 years is 442. The total to date is 14,751, as compared with 11,217 for the corresponding week last year and a 5-year median of 12,959.

Of the total of 2,837 cases of influenza reported for the week, 2,115 occurred in two States, Texas (1,609), and South Carolina (506). For the corresponding week last year these States reported 793 cases, or approximately 61 percent of the total of 1,309 cases reported for that week. The total to date is 88,432 as compared with 350,488 for the same period last year and a 5-year median of 176,684.

Deaths during the week in 91 large cities of the United States aggregated 8,888 as compared with 8,952 last week, 8,531 for the corresponding week last year, and a 3-year (1942–44) average of 8,563. The total to date is 399,302 as compared with 400,404 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 10, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944	
NEW ENGLAND												
Maine	2	0	0	------	------	------	0	0	54	1	0	0
New Hampshire	[3] 3	0	0	------	------	------	0	50	12	0	0	0
Vermont	0	0	0	------	------	------	0	8	8	0	0	0
Massachusetts	7	6	3	------	------	------	198	105	166	3	4	2
Rhode Island	1	0	0	------	31	------	0	1	1	0	1	1
Connecticut	0	0	0	------	2	2	9	12	12	1	3	3
MIDDLE ATLANTIC												
New York	10	9	16	[1] 2	[1] 2	[1] 3	80	25	127	16	21	17
New Jersey	2	6	5	5	2	2	9	12	26	3	4	3
Pennsylvania	7	9	9	3	1	1	374	25	207	11	13	8
E. NORTH CENTRAL												
Ohio	27	11	11	6	8	8	8	7	30	3	8	2
Indiana	16	4	7	21	12	12	5	6	7	2	7	1
Illinois	9	8	24	1	1	9	150	12	36	12	13	2
Michigan [2]	11	21	10	------	2	2	112	8	93	4	11	2
Wisconsin	2	0	1	32	14	18	20	14	95	6	2	1
W. NORTH CENTRAL												
Minnesota	9	9	9	------	------	1	4	5	5	1	3	1
Iowa	20	7	8	4	------	------	2	18	20	0	1	0
Missouri	11	4	4	1	1	2	10	0	5	0	2	0
North Dakota	8	3	3	------	------	1	0	2	2	1	0	0
South Dakota	3	2	3	7	------	------	2	1	2	1	0	0
Nebraska	9	1	4	4	15	5	4	6	5	1	0	0
Kansas	1	6	2	1	------	------	15	5	8	0	0	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	2	1	1	1	0
Maryland [2]	14	8	11	1	4	1	3	3	9	0	3	3
District of Columbia	1	0	0	2	1	2	3	1	1	1	2	0
Virginia	31	19	25	159	175	157	5	6	23	1	2	2
West Virginia	7	4	12	64	6	6	0	24	16	0	3	1
North Carolina	68	39	58	------	3	2	3	7	7	0	0	1
South Carolina	23	10	12	506	281	231	38	3	9	0	0	0
Georgia	30	18	24	7	22	22	8	3	4	1	0	0
Florida	2	6	5	3	2	2	1	1	1	1	5	0
E. SOUTH CENTRAL												
Kentucky	28	12	10	1	8	4	74	1	18	4	4	3
Tennessee	19	19	14	26	24	22	0	3	12	2	7	4
Alabama	18	35	28	21	16	27	1	2	12	3	5	1
Mississippi [2]	50	33	16	------	------	------	------	------	------	3	3	2
W. SOUTH CENTRAL												
Arkansas	22	10	15	116	21	26	15	1	5	0	0	0
Louisiana	16	18	12	37	3	3	1	1	1	0	1	1
Oklahoma	5	11	11	44	21	35	1	3	3	0	0	0
Texas	80	55	50	1,609	562	562	42	15	27	2	6	3
MOUNTAIN												
Montana	13	1	2	13	------	1	30	2	4	0	0	0
Idaho	4	1	1	18	------	------	99	0	3	1	1	0
Wyoming	1	1	1	1	23	7	0	0	3	0	0	0
Colorado	5	4	16	37	19	19	82	5	20	1	0	0
New Mexico	5	5	1	6	1	1	5	0	0	0	0	0
Arizona	4	0	3	62	54	76	2	1	2	1	1	0
Utah [2]	0	0	0	4	------	1	32	11	9	0	0	0
Nevada	0	0	0	------	------	------	0	0	0	0	0	0
PACIFIC												
Washington	11	5	3	------	------	1	229	22	22	4	1	1
Oregon	0	4	4	1	8	7	11	25	25	0	4	0
California	24	23	23	12	14	22	228	185	41	12	11	4
Total	645	442	442	2,887	1,309	1,555	1,910	594	2,008	104	153	69
45 weeks	[3] 14,751	11,217	12,959	88,432	350,488	176,684	112,066	597,152	557,876	7,207	14,781	3,059

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Delayed reports: New Hampshire—week ended October 27, 3 cases; week ended November 3, 1 case (included in cumulative total only).

Telegraphic morbidity reports from State health officers for the week ended November 10, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944		Nov. 10, 1945	Nov. 11, 1944	
NEW ENGLAND												
Maine	0	0	0	11	21	10	0	0	0	2	0	1
New Hampshire	1	0	0	0	2	9	0	0	0	0	0	0
Vermont	1	0	0	10	6	6	0	0	0	0	0	0
Massachusetts	14	9	4	121	145	145	0	0	0	3	1	1
Rhode Island	0	0	0	4	12	8	0	0	0	0	0	0
Connecticut	5	5	1	21	38	23	0	0	0	2	0	0
MIDDLE ATLANTIC												
New York	34	106	17	228	163	173	0	0	0	14	3	7
New Jersey	9	14	8	49	53	65	0	0	0	0	1	1
Pennsylvania	19	27	6	175	186	152	0	0	0	6	6	6
EAST NORTH CENTRAL												
Ohio	7	19	15	227	407	219	0	0	0	4	3	4
Indiana	2	0	1	63	47	53	0	0	0	0	2	1
Illinois	31	12	15	139	159	150	0	0	1	2	0	3
Michigan [3]	8	16	6	124	128	105	0	0	0	3	1	2
Wisconsin	53	2	7	68	50	115	0	0	1	0	0	0
WEST NORTH CENTRAL												
Minnesota	10	16	10	44	37	54	0	0	0	1	1	0
Iowa	12	2	2	46	43	45	0	1	0	0	0	1
Missouri	5	9	3	37	39	48	0	0	0	1	2	2
North Dakota	0	0	0	7	7	7	0	0	0	0	0	0
South Dakota	0	0	1	4	9	12	0	0	0	0	1	1
Nebraska	6	0	3	14	40	15	0	1	0	0	0	0
Kansas	1	2	2	72	79	71	0	0	0	1	1	1
SOUTH ATLANTIC												
Delaware	0	3	0	5	7	4	0	0	0	2	0	0
Maryland [3]	0	7	0	48	96	40	0	0	0	2	1	1
District of Columbia	1	0	0	16	14	14	0	0	0	0	0	0
Virginia	3	12	8	124	76	70	0	0	0	1	1	2
West Virginia	0	3	1	84	98	62	0	1	0	0	2	1
North Carolina	2	4	1	80	92	116	0	0	0	2	2	2
South Carolina	0	0	0	13	11	16	1	0	0	3	1	2
Georgia	2	0	1	22	33	32	0	0	0	1	4	4
Florida	6	1	1	0	5	5	0	0	0	1	2	2
EAST SOUTH CENTRAL												
Kentucky	1	9	6	70	49	53	0	0	0	0	2	6
Tennessee	7	2	1	51	89	89	0	0	0	1	2	3
Alabama	1	2	2	32	45	24	0	0	0	4	2	2
Mississippi [3]	2	2	2	41	20	12	0	0	0	1	5	1
WEST SOUTH CENTRAL												
Arkansas	2	0	1	18	13	9	0	0	0	6	2	5
Louisiana	4	1	0	12	14	11	0	0	0	4	2	5
Oklahoma	3	2	2	11	30	23	0	0	0	1	2	1
Texas	9	3	4	116	67	47	0	0	0	19	10	10
MOUNTAIN												
Montana	0	1	1	14	17	26	1	0	0	2	0	0
Idaho	2	1	1	7	35	11	0	0	0	0	0	1
Wyoming	0	0	0	0	10	7	0	0	0	0	0	0
Colorado	5	0	0	28	47	33	0	1	0	1	0	1
New Mexico	1	1	0	10	18	7	0	0	0	4	2	2
Arizona	1	0	0	6	11	10	0	0	0	0	5	1
Utah [3]	2	1	3	24	12	12	0	0	0	0	0	0
Nevada	0	0	0	0	3	3	0	0	0	0	0	0
PACIFIC												
Washington	13	6	6	58	41	41	0	0	1	1	1	0
Oregon	1	10	0	18	30	22	0	0	0	1	1	0
California	44	4	5	248	191	109	0	0	0	5	3	3
Total	330	314	243	2,626	2,845	2,518	2	4	8	101	74	98
45 weeks	12,672	18,202	8,995	153,872	165,835	118,948	304	344	698	4,466	4,955	6,209

[3] Period ended earlier than Saturday.

[4] Including paratyphoid fever reported separately, as follows: Massachusetts 2; Connecticut 1; New York 9; Georgia 1; Florida 1; Texas 2; Oregon 1; California 2.

Telegraphic morbidity reports from State health officers for the week ended November 10, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Nov. 10, 1945	Whooping cough: Week ended— Nov. 11, 1944	Whooping cough: Median 1940–44	Week ended November 10, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	15	25	25	0	0	0	0	0	0	0	1
New Hampshire	9	0	3	0	0	0	0	0	0	0	1
Vermont	27	81	31	0	0	0	0	0	0	0	2
Massachusetts	168	95	172	1	0	0	0	0	0	0	1
Rhode Island	19	2	18	0	0	0	0	0	0	0	0
Connecticut	74	54	66	0	5	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	357	166	450	5	77	0	2	0	0	3	3
New Jersey	177	69	137	5	1	1	1	0	0	0	1
Pennsylvania	254	139	250	0	0	0	0	0	0	0	3
EAST NORTH CENTRAL											
Ohio	168	189	189	0	0	1	0	0	0	0	3
Indiana	26	21	13	0	0	0	0	0	0	0	1
Illinois	151	76	152	3	2	0	3	0	1	0	8
Michigan [2]	100	47	232	0	2	0	0	0	0	0	6
Wisconsin	61	62	191	0	0	0	0	0	1	0	6
WEST NORTH CENTRAL											
Minnesota	16	32	45	2	0	0	0	0	0	0	7
Iowa	11	0	24	0	0	0	0	0	0	0	0
Missouri	4	14	12	0	0	0	0	0	0	0	1
North Dakota	0	8	9	0	0	0	0	0	0	0	0
South Dakota	0	3	5	0	0	1	0	0	0	0	0
Nebraska	3	6	8	0	0	0	0	0	0	0	0
Kansas	17	14	17	1	0	0	0	0	0	0	8
SOUTH ATLANTIC											
Delaware	3	0	1	0	0	0	0	0	0	0	0
Maryland [2]	45	55	55	0	0	2	0	0	0	0	0
District of Columbia	6	1	12	0	0	0	0	0	0	0	0
Virginia	35	26	50	0	0	32	0	0	0	0	0
West Virginia	17	7	16	0	0	0	0	0	0	0	0
North Carolina	49	37	113	1	2	0	0	1	0	6	0
South Carolina	72	25	25	1	11	0	0	0	0	0	0
Georgia	11	18	18	0	0	0	0	0	0	48	3
Florida	2	17	16	1	1	0	0	0	0	6	0
EAST SOUTH CENTRAL											
Kentucky	113	47	59	0	0	0	0	3	0	0	1
Tennessee	14	40	27	1	0	1	0	0	0	3	1
Alabama	11	5	8	1	0	0	0	0	2	15	0
Mississippi [2]	------	------	------	0	0	0	0	0	2	7	3
WEST SOUTH CENTRAL											
Arkansas	12	26	22	1	1	0	0	0	2	2	0
Louisiana	1	3	6	1	0	0	0	0	0	15	2
Oklahoma	0	3	4	0	0	0	0	0	0	0	0
Texas	113	134	89	24	209	9	0	0	0	82	12
MOUNTAIN											
Montana	2	2	2	0	0	0	0	0	0	0	0
Idaho	12	3	4	1	0	2	0	0	0	0	1
Wyoming	3	12	3	0	0	0	0	0	0	0	0
Colorado	16	14	17	0	0	0	0	0	0	0	0
New Mexico	2	1	7	0	1	1	0	0	0	0	0
Arizona	6	14	14	0	0	45	0	0	0	0	0
Utah [2]	13	11	26	0	0	0	0	0	0	0	0
Nevada	4	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	26	7	37	0	0	0	0	0	0	0	0
Oregon	10	7	12	0	0	0	0	0	0	0	0
California	98	93	142	2	7	0	4	0	0	9	4
Total	2,359	1,661	2,998	51	819	95	10	4	8	196	80
Same week, 1944	1,661	------	------	28	503	122	7	3	11	102	65
Average, 1942–44	2,342	------	------	31	361	118	11	[5] 1	8	[5] 87	------
45 weeks: 1945	109,086	------	------	1,714	22,298	9,755	574	460	640	4,481	4,138
1944	82,789	------	------	1,612	21,048	7,883	577	450	489	4,528	3,467
Average, 1942–44	133,297	------	[5] 155,529	1,511	15,623	6,965	566	[5] 450	652	[5] 3,201	------

[2] Period ended earlier than Saturday.
[5] 5-year median, 1940–44.

Anthrax: Ohio, 1 case.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 3, 1945

This table lists the reports from 88 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	1	0	1	0	1	1	1	0	4	0	0	[illegible]
New Hampshire:												
Concord	0	0	------	0	0	0	0	0	0	0	0	[illegible]
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	1
Massachusetts:												
Boston	2	0	----	0	5	0	14	12	26	0	0	[illegible]
Fall River	0	0	------	0	0	1	0	0	1	0	0	[illegible]
Springfield	0	0	------	0	1	0	0	0	8	0	0	[illegible]
Worcester	0	0	------	0	31	0	5	0	7	0	0	[illegible]
Rhode Island:												
Providence	0	0	------	0	0	0	1	0	1	0	0	[illegible]
Connecticut:												
Bridgeport	0	0	------	0	0	0	1	0	1	0	0	[illegible]
Hartford	0	0	------	0	0	0	1	2	1	0	0	[illegible]
New Haven	0	0	------	0	0	0	1	0	0	0	0	1
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	0	0	1	0	6	0	0	[illegible]
New York	12	1	2	2	33	10	37	12	60	0	2	[illegible]
Rochester	0	0	------	0	0	1	0	2	9	0	0	[illegible]
Syracuse	0	0	------	0	1	0	1	1	17	0	0	[illegible]
New Jersey:												
Camden	0	0	-----	0	0	0	2	0	0	0	0	[illegible]
Newark	0	0	2	0	3	0	5	1	7	0	0	[illegible]
Trenton	0	0	------	0	0	0	0	1	0	0	0	[illegible]
Pennsylvania:												
Philadelphia	3	0	1	0	7	2	19	3	82	0	0	[illegible]
Pittsburgh	0	0	1	1	2	2	12	3	18	0	0	[illegible]
Reading	0	0	------	0	1	0	2	0	1	0	0	
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	1	0	------	0	1	2	13	0	14	0	0	
Cleveland	0	0	2	0	1	1	7	4	28	0	0	6
Columbus	3	0	------	0	3	0	0	0	12	0	0	
Indiana:												
Fort Wayne	0	0	-----	0	0	0	0	0	1	0	0	[illegible]
Indianapolis	4	0	------	0	1	2	4	0	21	0	0	1
South Bend	0	0	------	0	0	0	0	0	2	0	0	
Terre Haute	0	0	------	0	0	0	5	0	1	0	0	
Illinois:												
Chicago	0	0	------	0	110	8	22	2	38	0	0	6
Springfield	0	0	------	0	4	0	2	0	3	0	0	
Michigan:												
Detroit	5	0	------	0	25	1	6	1	30	0	0	5
Flint	0	0	------	0	9	1	1	0	3	0	0	
Grand Rapids	1	0	-----	0	0	0	1	1	3	0	0	
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	2	0	0	
Milwaukee	0	0	------	0	3	0	0	4	13	0	0	1
Racine	0	0	------	0	0	0	0	0	0	0	0	
Superior	0	0	------	0	1	0	0	0	0	0	0	
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	0	0	0	0	3	0	0	
Minneapolis	2	0	------	0	2	0	4	0	3	0	0	
St. Paul	1	0	------	0	0	2	4	0	7	0	1	1
Missouri:												
Kansas City	1	0	------	0	1	0	6	0	11	0	1	
St. Joseph	1	0	------	0	10	0	0	0	1	0	0	
St. Louis	6	0	2	0	1	2	13	19	12	0	1	

See footnotes at end of table.

City reports for week ended November 3, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	1	0	0	1	11	0	0	0
Kansas:												
Topeka	0	0	------	0	0	0	1	0	1	0	0	4
Wichita	0	0	------	0	0	0	4	2	16	0	0	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	0	0	0	0	0	0	0	1
Maryland:												
Baltimore	18	0	1	0	2	1	18	0	7	0	0	25
Cumberland	0	0	------	0	0	0	1	0	1	0	0	0
Frederick	0	0	------	0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	1	------	0	2	0	10	4	19	0	3	7
Virginia:												
Lynchburg	0	0	------	0	0	0	0	0	2	0	1	3
Richmond	1	0	------	0	1	0	2	1	6	0	0	2
Roanoke	0	0	------	0	0	0	0	0	3	0	0	0
West Virginia:												
Charleston	0	0	------	0	0	0	0	0	2	0	0	0
Wheeling	0	0	------	0	0	0	0	0	1	0	0	0
North Carolina:												
Raleigh	0	0	------	0	0	0	0	0	0	0	0	2
Wilmington	2	0	------	0	0	0	0	0	4	0	0	0
Winston-Salem	0	0	------	0	0	0	0	0	4	0	0	6
South Carolina:												
Charleston	2	0	23	0	0	0	2	0	3	0	0	0
Georgia:												
Atlanta	1	0	2	0	0	0	3	0	2	0	0	1
Brunswick	0	0	------	0	0	0	0	0	1	0	0	0
Savannah	0	0	------	0	0	0	1	0	4	0	1	0
Florida:												
Tampa	0	0	------	0	0	0	1	0	1	0	1	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	2	0	3	1	2	0	6	1	9	0	0	6
Nashville	1	0	------	0	1	0	3	1	2	0	0	2
Alabama:												
Birmingham	0	0	6	0	0	0	0	7	10	0	0	
Mobile	3	0	------	0	0	0	2	0	2	0	0	
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0	------	0	0	0	0	0	2	0	0	
Louisiana:												
New Orleans	6	0	1	1	1	0	5	1	7	0	1	0
Shreveport	0	0	------	0	0	0	0	2	6	0	0	0
Texas:												
Dallas	3	0	------	0	0	0	4	0	16	0	0	0
Galveston	0	0	------	0	0	0	1	0	2	0	0	3
Houston	1	0	------	0	0	1	4	2	3	0	1	0
San Antonio	1	0	------	0	0	1	5	0	2	0	0	1
MOUNTAIN												
Montana:												
Billings	0	0	------	0	0	0	0	1	1	0	0	0
Great Falls	0	0	------	0	0	0	0	0	0	0	0	0
Helena	0	0	------	0	0	0	0	0	1	0	0	0
Missoula	0	0	------	0	2	0	0	0	0	0	0	0
Idaho:												
Boise	0	0	------	0	0	1	1	1	1	0	0	0
Colorado:												
Denver	6	0	4	0	7	0	7	1	5	0	2	14
Utah:												
Salt Lake City	0	0	0	0	5	0	0	2	5	0	0	4

City reports for week ended November 3, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Seattle	1	0		1	41	0	4	0	6	0	1	6
Spokane	0	0		0	0	0	2	0	5	0	0	2
Tacoma	0	0		0	28	0	0	0	1	0	0	2
California:												
Los Angeles	8	0	4	1	5	0	2	3	42	0	0	14
Sacramento	0	0		0	2	0	2	1	3	0	0	2
San Francisco	0	0		0	43	0	9	6	14	0	1	8
Total	99	2	55	7	409	40	285	105	640	0	17	703
Corresponding week, 1944	111		51	15	168		353		642	0	21	469
Average, 1940-44	90		74	[1] 23	[2] 474		[1] 351		644	1	21	903

[1] 3-year average, 1942-44. [2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York, 4; Chicago, 1; Denver, 1.

Dysentery, bacillary.—Cases: Providence, 2; New Haven, 1; New York, 7; Syracuse, 1; Chicago, 1; Detroit, 1; Tampa, 1; Nashville, 1; Los Angeles, 1; San Francisco, 1.

Dysentery, unspecified.—Cases: Bridgeport, 4; San Antonio, 9.

Typhus fever, endemic.—Cases: New York, 1, Atlanta, 13; Savannah, 4; Tampa, 1; Birmingham, 1; New Orleans, 2; Shreveport, 3; San Antonio, 1; Los Angeles, 2.

Rates (annual basis) per 100,000 population, by geographic groups, for the 88 cities in the preceding table (estimated population, 1943, 34,311,800)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	7.8	0.0	2.6	0.0	99	5.2	62.7	36.6	128	0.0	0.0	212
Middle Atlantic	6.9	0.5	2.8	1.4	22	6.9	36.6	10.6	69	0.0	0.9	112
East North Central	8.5	0.0	1.2	0.0	102	9.1	37.1	7.3	104	0.0	0.0	146
West North Central	22.1	0.0	4.0	0.0	30	8.0	62.3	44.2	131	0.0	6.0	54
South Atlantic	30.2	1.6	42.5	0.0	8	1.6	58.9	8.2	98	0.0	9.8	77
East South Central	35.4	0.0	53.1	5.9	18	0.0	64.9	53.1	136	0.0	0.0	53
West South Central	31.6	0.0	2.9	2.9	3	5.7	54.5	14.8	109	0.0	5.7	11
Mountain	52.0	0.0	34.7	0.0	121	8.7	69.4	43.3	113	0.0	17.3	156
Pacific	14.2	0.0	6.3	3.2	188	0.0	30.0	15.8	112	0.0	3.2	54
Total	15.1	0.3	8.4	1.1	62	6.1	43.4	16.0	98	0.0	2.6	107

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 20, 1945.—During the week ended October 20, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		6		78	188	40	31	47	106	446
Diphtheria		3	5	41	11	1		5		66
Dysentery:										
Bacillary				4						4
Unspecified					1					1
Encephalitis, infectious		1						1		2
German measles				4	6		1	4	3	18
Influenza		5			5				5	15
Measles		4	1	117	178	2	6		159	467
Meningitis, meningococcus				2	2					4
Mumps			2	72	95	7	7	110	30	323
Poliomyelitis		1		1	[1] 9	1	1			[1] 13
Scarlet fever		4	20	83	62	20	7	22	12	239
Tuberculosis (all forms)		7	2	115	25	17	14	70	24	274
Typhoid and paratyphoid fever		1		17	1					19
Undulant fever				5						5
Venereal diseases:										
Gonorrhea		17	44	79	193	55	38	63	70	559
Syphilis		27	21	177	113	17	5	17	22	399
Whooping cough			19	220	69	10	2	2		322

[1] Includes 1 case, delayed reports.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present.]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January–August 1945	September 1945	October 1945—week ended— 6	13	20	27
ASIA							
Ceylon: Trincomalee District	C				13	1	2
China: [1]							
Hupeh Province	C	14					
Kweichow Province—Kweijang	C	12					
Szechwan Province—							
Chengtu	C	9					
Chungking	C	8,000					
Hsin Chiaco	C	1					
Hsin Kai Shih	C	1					
Kiang Pei	C	1					
Kweyang	C	26					
Nei Kiang	C	200					
Pi Shan	C	40					
Yunnan Province	C	P					
India	C	199,985					
Bombay	C	76	19		2		
Calcutta	C	4,859	141	28	31		
Cawnpore	C	187	12				
Chittagong	C	19					
Delhi	C	249	65	3	1		
Madras	C	52					
Vizagapatam	C	29					
Indochina: Cochinchina	C	P					

[1] Cholera was also reported present during August in the following Provinces of China: Chekiang, Honan' Hunan, Kansu, Kwangsi, Kwangtung, Shensi, and Sikong.

PLAGUE

[C indicates cases D deaths]

Place		January-August 1945	September 1945	October 1945—week ended— 6	13	20	27
AFRICA							
Algeria	C	[1] 13					
Basutoland	C	4					
Bechuanaland	C	7					
Belgian Congo	C	17					[2] 7
British East Africa							
Kenya	C	[3] 48	23	1	1		
Uganda	C	6					
Egypt	C	213		1	3		
Ismailiya	C	83					
Port Said	C	80	2		1		
Suez	C	19		1	2		
French West Africa	C	5					
Dakar	C	1					
Madagascar	C	118	[illegible]			[4] 3	
Morocco (French)	C	787	13			[4] 27	
Senegal	C	54					
Tunisia	C	8					
Union of South Africa	C	[illegible]			1		
ASIA							
China							
Foochow	C	30					
Yunnan Province [5]	C	25					
India	C	13 45[illegible]					
Iraq	C	34					
Palestine	C	17	1		1	2	2
Plague infected rats		20	1				
EUROPE							
France Corsica—Ajaccio	C	8					
Great Britain Malta	C	[6] 2[illegible]	25	5		[illegible]	
Italy	C		23			1	1
Portugal Azores	C	12	12	2			
Spain Canary Islands	C	1					
NORTH AMERICA							
Canada Alberta Province [7]							
Plague infected squirrels		2					
SOUTH AMERICA							
Argentina							
Buenos Aires Province—Plague infected rats		2					
Santiago del Estero Province	C	1					
Bolivia Santa Cruz Department	C	[8] [illegible]5					
Brazil Pernambuco State	C	[illegible]0					
Ecuador							
Canar Province	C	7					
Chimborazo Province	C	[illegible]					
Loja Province	C	19					
Peru							
Ancash Department	C	3					
Ica Department	C	[9] 4					
Lambayeque Department	C	13					
Libertad Department	C	11					
Lima Department	C	13					
Otuzco Department	C	3					
Piura Department	C	4	1				
OCEANIA							
Hawaii Territory	D	[10] 1					
Plague infected rats [11]		12	1				

[1] Includes 4 cases of pneumonic plague
[2] Suspected
[3] Includes 5 suspected cases
[4] For the period Oct 1-20 1945
[5] Information dated July 5 1945 stated that from April 1944 to May 1945 85 deaths from plague had occurred in the mountainous region south of Kunming, China
[6] Includes 4 suspected cases
[7] During the month of June 1945 plague infection in fleas was reported in Alberta Province For the week ended July 28, 1945 plague infection was also reported in 6 pools of fleas in Alberta Province For the week ended Aug 11, 1945 2 pools of plague infected fleas were reported in Alberta Province Canada
[8] Includes 6 suspected cases
[9] Includes 1 suspected case
[10] Previously reported as a case death occurring on June 2, 1945
[11] Plague infection was also proved positive in a pool of 5 mice on Jan 4 in a pool of fleas on Feb 14 and in a pool of 40 fleas on Mar 14, 1945

SMALLPOX

[C indicates cases; P, present]

Place		January-August 1945	September 1945	October 1945—week ended—			
				6	13	20	27
AFRICA							
Algeria	C	189	20				
Angola	C	106					
Basutoland	C	345	1				
Belgian Congo	C	5,587	532	[1] 58			
British East Africa:							
Kenya	C	184	183	25	6		
Nyasaland	C	9	80	17	1	18	
Tanganyika	C	3,395	1,172				
Uganda	C	879	55				
Cameroon (French)	C	766	43				
Dahomey	C	151	55		[2] 48		
Egypt	C	1,058	7				
French Equatorial Africa	C	1,541	13				
French Guinea	C	1,515	53		[2] 19		
French West Africa: Dakar District	C	392	5		[2] 4		
Gambia	C	82					
Gold Coast	C	200	224	16			16
Ivory Coast	C	492	22		[2] 1		
Libya	C	8					
Mauritania	C	83					
Morocco (French)	C	1,205	167		[2] 166		
Mozambique	C		1				
Nigeria	C	3,687	137				
Niger Territory	C	478	33				
Rhodesia:							
Northern	C	2,081	2,104				
Southern	C		10				
Senegal	C	491	7				
Sierra Leone	C	31	P				
Sudan (Anglo-Egyptian)	C	[3] 3					
Sudan (French)	C	2,055	59		[2] 45		
Togo (British)	C	25	11				
Togo (French)	C	496					
Tunisia	C	2	13				
Union of South Africa [4]	C	1,499	27	P	P	P	
ASIA							
Arabia	C	29					
Ceylon	C	[5] 527	63	10	13	11	30
China	C	1,136					
India	C	222,435					
Iran	C	390					
Iraq	C	38	1	[3] 2			
Syria and Lebanon	C	10	2				
Trans-Jordan	C	2					
Turkey (see Turkey in Europe.)							
EUROPE							
Belgium	C	1					
France	C	26					
Great Britain: Scotland	C	[3] 2					
Italy	C	1,930					
Sicily	C	9					
Portugal	C	25	1				
Spain	C	30	1				
Canary Islands	C	1					
Turkey	C	291	3		1		
NORTH AMERICA							
Canada	C	6					
Guatemala	C	4					
Honduras	C	8					
Mexico	C	1,309					
Nicaragua	C	[1] 141					
SOUTH AMERICA							
Bolivia	C	990					
Brazil	C	[6] 613					
Colombia	C	418		4			
Ecuador	C	36	2				
Paraguay	C	1					
Peru	C	50					
Uruguay	C	79					
Venezuela	C	[1] 560	[1] 104			[1] 12	

[1] Alastrim.
[2] For the period Oct. 1–10, 1945.
[3] Imported.
[4] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Union of South Africa.
[5] Includes some cases of chickenpox.
[6] Includes cases of alastrim.

TYPHUS FEVER*

[C indicates cases; P, present]

Place		January-August 1945	September 1945	October 1945—week ended— 6	13	20	27
AFRICA							
Algeria	C	1,018	8				
Basutoland	C	230					
Belgian Congo [1]	C	209	45	6			
British East Africa: Kenya	C	30	1				
Egypt	C	15,271	145				
French West Africa: Dakar [1]	C	18					
Gold Coast	C	1					
Libya: Tripolitania	C	18					
Madagascar	C	1					
Morocco (French)	C	6,892	292			[2] 268	
Morocco (Spanish)	C	6					
Nigeria	C	64	14				
Rhodesia, Northern	C	81					
Sierra Leone [1]	C	3	3				
Tunisia	C	380	5				
Union of South Africa	C	582	12		P	P	
ASIA							
China	C	1,352					
India	C	23					
Iran	C	824					
Iraq	C	228	12		4	1	2
Palestine [1]	C	104		1	2		
Syria and Lebanon	C	12					
Trans-Jordan	C	43			2		
Turkey (see Turkey in Europe).							
EUROPE							
Albania	C	100					
Austria	C	46					
Belgium	C	158					
Bulgaria	C	928	4				
Czechoslovakia	C	290	10				
Denmark	C	146					
Finland	C	26					
France	C	267					
Germany	C	7,888					
Gibraltar	C	5					
Great Britain	C	[3] 21					
Malta and Gozo [1]	C	15					
Greece	C	154	57				
Italy	C	183	2				
Netherlands	C	51					
Portugal	C	49					
Rumania	C	[4] 7,831					
Spain	C	24	1				
Sweden	C	225	1				
Switzerland	C	2					
Turkey	C	2,391	57	15	14	24	10
Yugoslavia	C	1,194					
NORTH AMERICA							
Canada [1]	C	1					
Costa Rica [1]	C	7					
Cuba [1]	C	10					
Guatemala	C	1,928					
Jamaica [1]	C	35	2				
Martinique [1]	C	1					
Mexico	C	1,279					
Panama (Republic)	C	3					
Puerto Rico [1]	C	144	10	8	2	4	4
Virgin Islands [1]	C	8					
SOUTH AMERICA							
Argentina	C	6					
Bolivia	C	562					
Brazil	C	3					
Chile [1]	C	419					
Colombia	C	127				70	
Curacao	C	1	1				
Ecuador	C	405	57				
Peru	C	372					
Venezuela [1]	C	88	10				
OCEANIA							
Australia [1]	C	91					
Hawaii Territory [1]	C	72	10				

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Reports cases as murine type.
[2] For the period Oct. 1-20, 1945.
[3] Includes imported cases.
[4] For the period Jan. 1-20, 1945.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January–August 1945	September 1945	October 1945—week ended—			
				6	13	20	27
AFRICA							
Gold Coast:							
Nsawam	C	[1]3					
Takoradi	C	1					
Tamale	C		[2]1				
Winneba	C	[3]4					
Ivory coast:							
Gaoua	C	1					
Guiglo	C	1					
Sierra Leone: Moyamba	C	2					
SOUTH AMERICA							
Bolivia:							
Beni Department	C	1					
La Paz Department	C	2					
Brazil:							
Goiaz State	D	76					
Minas Geraes State	D	25					
Para State	D	1					
Colombia:							
Magdalena Department	D	2					
Santander de Norte Department	D	18					
Peru:							
Cuzco Department	C	3					
Junin Department	C				3		
Loreto Department	C	1					
Venezuela:							
Bolivar State	C	1					
Merida State	C	2					1
Tachira State	D	20					
Zulia State	C	6	1		1		

[1] Includes 2 suspected cases.
[2] Suspected.
[3] Includes 1 suspected case.

×

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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THE AGE FACTOR IN DISABLING MORBIDITY, 1940–44

EXPERIENCE IN A PUBLIC UTILITY COMPANY [1]

By W. M. GAFAFER, *Principal Statistician*, and ROSEDITH SITGREAVES, *Assistant Statistician, United States Public Health Service*

The present report, the eleventh of the series (*1–10*), deals with the sickness absenteeism experience of the Boston Edison Company during the 5 years 1940–44, in terms essentially of the time and age changes in three basic morbidity rates. An examination of such changes is particularly indicated at the present time because of the unprecedented variation in the age composition of the employee population during the period under study.

The purpose of the report, therefore, is twofold, first to bring the series up to date with a presentation and an analysis of the appropriate data for recent years, and, second, which is perhaps of equal importance, to examine the effects on sickness absenteeism of the age factor.

The supporting absenteeism data, from company records, were reported periodically by the company to the Industrial Hygiene Division. These data represent absences due to sickness and injuries disabling for 1 calendar day or longer, and ending in the time period specified. In general, absences ended in the employee's recovery and return to work, although a small number of disabilities resulted in death or retirement. Less than 0.5 percent of all absences lasted longer than a year and these were arbitrarily terminated at 372 days.

The three basic morbidity rates comprise the frequency rate, or average annual number of absences per 1,000 persons; the disability rate, or average annual number of days of disability per person; and the severity rate, or average number of days per absence.

Table 1 shows for each sex and year the number of absences and days of disability, together with the number of person-years of ex-

[1] From the Industrial Hygiene Division, Bureau of State Services

posure, for employees of all ages and those in five age groups. Table 2 is derived from table 1 and presents the pertinent morbidity rates.

Person-years of exposure.—The total number of person-years of exposure given in table 1 by sex and year is derived from periodic reports from the company listing the average number of males and

TABLE 1.—*Number of absences lasting 1 calendar day or longer and number of days of disability due to sickness and injuries by sex, age, and year in which absence ended; experience of male and female employees in a public utility, 1940–44, inclusive* [1]

Year in which absence ended	Males						Females					
	All ages [2]	Age group					All ages [2]	Age group				
		Under 25	25–34	35–44	45–54	55 and over		Under 25	25–34	35–44	45–54	55 and over
	Number of absences											
1940–44	13,720	867	3,203	4,364	3,260	2,021	5,921	1,854	1,392	1,471	856	397
1940	2,324	172	700	649	490	313	981	184	354	269	137	87
1941	2,422	198	648	721	511	342	914	111	307	298	138	60
1942	2,671	221	675	780	614	378	940	250	240	244	139	66
1943	3,051	152	617	1,093	741	448	1,489	602	251	359	199	78
1944	3,252	124	563	1,121	904	540	1,597	707	240	301	243	106
	Number of days of disability											
1940–44	123,139	3,887	18,117	34,250	32,213	34,499	35,219	6,027	7,331	9,082	8,309	4,432
1940	21,796	1,107	4,799	5,869	4,696	5,325	6,195	686	1,925	1,475	1,200	909
1941	23,303	921	3,867	6,456	5,354	6,622	7,142	458	2,063	2,266	1,346	1,009
1942	24,497	800	4,408	6,378	6,486	6,335	6,313	1,009	1,391	1,603	1,692	580
1943	24,462	632	2,691	6,951	7,712	6,476	7,285	1,870	1,010	2,277	1,197	931
1944	29,081	427	2,352	8,596	7,965	9,741	8,284	2,004	942	1,461	2,874	1,003
	Number of person-years of exposure [3]											
1940–44	12,116	608	2,641	3,906	3,096	1,865	2,771	542	705	816	498	210
1940	2,706	154	752	828	623	349	534	79	193	181	88	43
1941	2,702	157	697	843	648	357	572	78	171	184	95	44
1942	2,483	157	576	792	603	355	583	78	143	174	99	39
1943	2,147	88	361	726	590	382	548	146	110	141	108	43
1944	2,078	52	255	717	632	422	534	161	88	136	108	41

[1] The number of days of disability is the number of calendar days from the date absence began to the date absence ended, or to the 372d day, inclusive.
[2] Includes a negligible number of absent persons of unknown age.
[3] The age distributions applied to the total number of person-years of exposure for the years 1940–43 are as of Jan. 1 of each year; for the year 1944 the distribution is as of Dec. 1, 1943.

females on the pay roll during a month. The monthly figures are summed to obtain the person-months of exposure, and divided by 12 to give the number of person-years. Male and female age distributions, recently made available, permit the calculation and application of appropriate percentages to the annual number of male and female person-years of exposure, thus distributing the person-years according to age group. The calculated percentages used in determining

TABLE 2.—*Morbidity rates by sex, age, and year in which absence ended; experience of male and female employees in a public utility, 1940–44, inclusive* [1] *(based on table 1)*

Year in which absence ended	Males							Females						
	All ages [2]		Age group					All ages [2]		Age group				
	Crude	Standardized [3]	Under 25	25–34	35–44	45–54	55 and over	Crude	Standardized [3]	Under 25	25–34	35–44	45–54	55 and over
	Average annual number of absences per 1,000 persons													
1940–44	1,182.4	1,181.8	1,426.0	1,212.8	1,117.3	1,053.0	1,083.6	2,136.8	2,354.3	3,328.4	1,974.5	1,802.7	1,718.9	1,860.5
1940	858.8	902.5	1,116.9	930.9	783.8	786.5	896.8	1,679.8	1,698.6	1,696.2	1,834.2	1,486.2	1,556.8	2,028.3
1941	896.4	957.4	1,261.1	923.7	855.3	788.6	958.0	1,597.9	1,549.3	1,423.1	1,795.3	1,619.6	1,452.6	1,368.6
1942	1,075.7	1,130.3	1,407.6	1,171.9	984.8	1,018.2	1,064.8	1,768.6	2,102.4	3,205.1	1,678.3	1,402.3	1,404.0	1,692.3
1943	1,421.1	1,490.7	1,727.3	1,709.1	1,505.5	1,255.9	1,172.8	2,717.2	2,850.5	4,123.3	2,281.8	2,546.1	1,842.6	1,814.0
1944	1,565.0	1,795.9	2,384.6	2,207.8	1,563.5	1,430.4	1,279.6	2,990.6	3,109.2	4,391.3	2,727.3	2,213.2	2,250.0	2,585.4
	Average annual number of days per person													
1940–44	10.163	9.854	6.393	6.860	8.769	10.405	18.498	12.710	12.621	11.120	10.399	11.130	16.685	21.105
1940	8.055	8.440	7.188	6.382	7.088	7.538	15.258	10.608	10.699	8.684	9.974	8.149	13.636	21.140
1941	8.624	8.819	5.866	5.548	7.658	8.262	18.549	12.486	11.297	5.872	12.064	12.315	14.168	22.932
1942	9.866	9.571	5.096	7.653	8.053	10.756	17.845	11.844	12.195	12.936	9.727	9.213	17.091	14.872
1943	11.394	10.554	7.182	7.454	9.574	13.071	16.953	13.294	13.142	12.808	9.182	16.149	11.083	21.651
1944	13.995	12.648	8.212	9.224	11.989	12.603	23.083	15.518	14.749	12.447	10.705	10.743	26.611	24.463
	Average number of days per absence													
1940–44	8.98	8.34	4.48	5.66	7.85	9.88	17.07	5.95	5.36	3.34	5.27	6.17	9.71	11.16
1940	9.38	9.35	6.44	6.86	9.04	9.58	17.01	6.31	6.30	5.12	5.44	5.48	8.76	10.45
1941	9.62	9.21	4.65	5.97	8.95	10.48	19.36	7.81	7.29	4.13	6.72	7.60	9.75	16.82
1942	9.17	8.47	3.62	6.53	8.18	10.56	16.76	6.72	5.80	4.04	5.80	6.57	12.17	8.79
1943	8.02	7.08	4.16	4.36	6.36	10.41	14.46	4.89	4.61	3.11	4.02	6.34	6.02	11.94
1944	8.94	7.04	3.44	4.18	7.67	8.81	18.04	5.19	4.74	2.83	3.92	4.85	11.83	9.46

[1] The number of days of disability is the number of calendar days from the date absence began to the date absence ended, or to the 372d day, inclusive.
[2] Includes a negligible number of absent persons of unknown age.
[3] Age-standardized according to estimates of male and female employment in the United States for the week ending June 13, 1942 (*11*).

NOTE.—The number of person-years of exposure is given in table 1.

the age distributions of the person-years of exposure are shown in the accompanying table.

Year (January 1)	Percent of public utility employees in specified age groups					
	All ages	Under 25	25-34	35-44	45-54	55 and over
	Males					
1940	100.0	5.7	27.8	30.6	23.0	12.9
1941	100.0	5.8	25.8	31.2	24.0	13.2
1942	100.0	6.3	23.2	31.9	24.3	14.3
1943	100.0	4.1	16.8	33.8	27.5	17.8
1944 (Dec. 1, 1943)	100.0	2.5	12.3	34.5	30.4	20.3
	Females					
1940	100.0	13.5	33.1	31.0	15.0	7.4
1941	100.0	13.7	29.9	32.1	16.6	7.7
1942	100.0	14.7	26.8	32.6	18.6	7.3
1943	100.0	26.6	20.1	25.8	19.7	7.8
1944 (Dec. 1, 1943)	100.0	30.2	16.4	25.5	20.2	7.7

In 1940 approximately one-third of the male employees was under 35 years of age, one-third was 35 to 44 years, and the remaining third was 45 years and over. By 1944 the proportion under 35 had decreased to 15 percent while over half of the males was 45 and over, the proportion 55 years of age and over increasing from one-eighth to one-fifth.

The females, on the average, were appreciably younger than the males, with approximately 45 percent under 35 years of age throughout the period under study. During the 5 years the proportion of females under 25 increased from 14 to 30 percent, but at the same time a decrease from 33 to 16 percent occurred in the proportion 25 to 34 years old.

The contribution made by each age group to the total number of person-years of exposure is shown graphically in figure 1 for each of the 5 years and for each sex. Particularly noteworthy is the decrease in the total number of male-years of exposure from 2,700 in 1940 and 1941 to less than 2,100 in 1944, reflecting primarily marked decreases in the male-years contributed by the 2 youngest age groups. It is of interest to observe in this connection that although the proportion of males in the 3 groups 35 years of age and over was increasing throughout the 5-year period, the number of person-years of exposure resulting from the application of these proportions to the decreasing total exposure shows a relatively small amount of variation. In general it will be remembered that male workers under 35 years of age constituted the group principally affected by the demands of war, either by induction into the armed forces or by transfer to other jobs.

Time changes in rates.—Because of the changing age composition of the exposed population, male and female rates for each year were standardized according to the estimated age distribution of male and

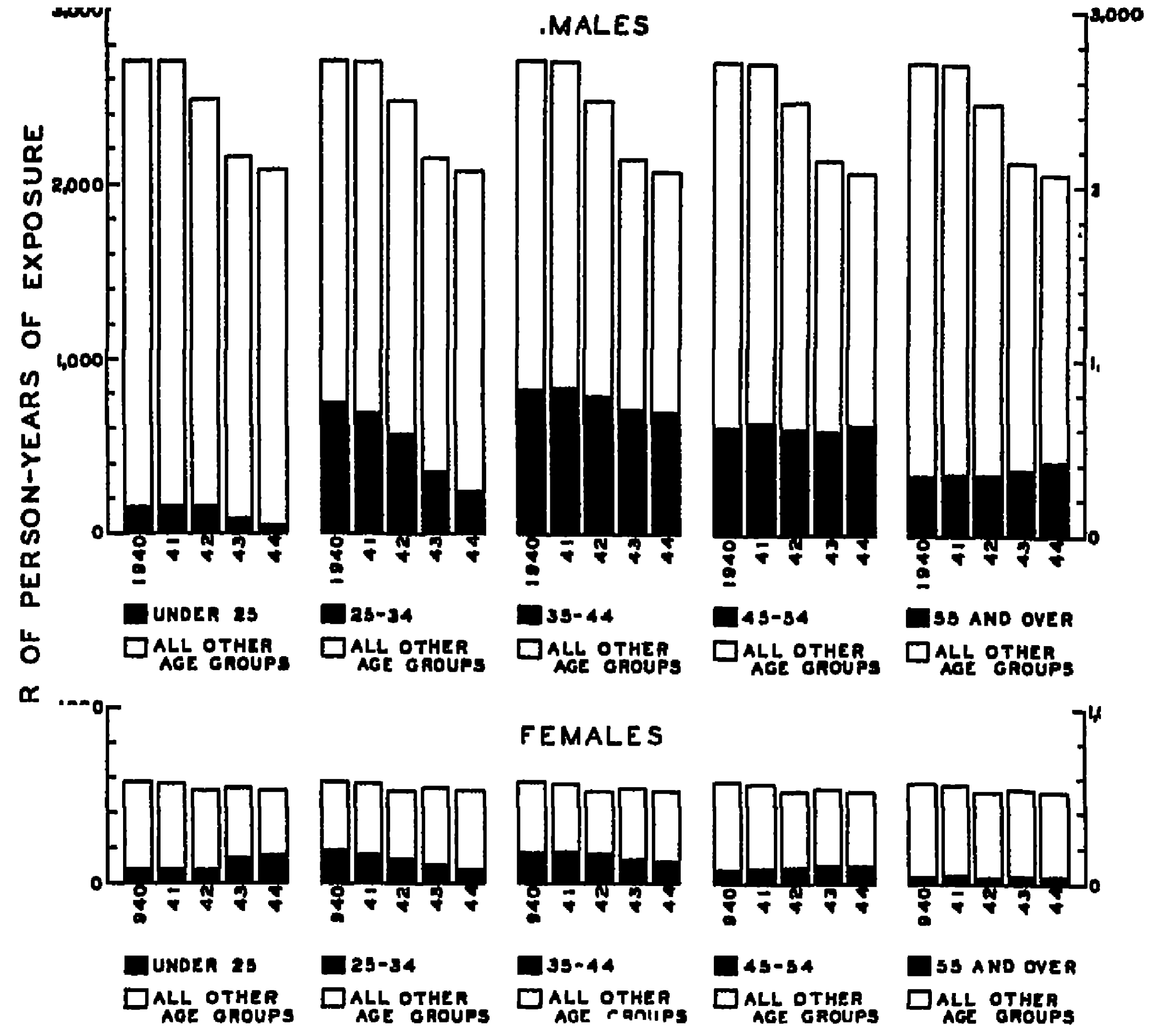

FIGURE 1.—Time changes in number of person-years of exposure for different age groups, by sex; experience of male and female employees in a public utility, 1940–44, inclusive. (Each bar for a particular year represents the total number of person-years of exposure for the year and the contribution made to that number by a particular age group.)

female employees in the United States for the week ending June 13, 1942, the approximate midpoint of the 5-year period (*11*). These rates are shown in table 2. The male and female distributions for the United States are presented in the accompanying table; it will be

Sex	Estimates of United States employees in specified age groups for week ending June 13, 1942					
	All ages	Under 25	25–34	35–44	45–54	55 and over
	Percent					
Males	100.0	19.8	22.3	21.9	18.8	17.2
Females	100.0	33.7	24.0	19.4	13.9	9.0
	Number in millions (from reference *11*)					
Males	39.18	7.76	8.72	8.59	7.35	6.76
Females	14.53	4.90	3.49	2.82	2.02	1.30

observed that they include a larger proportion of younger persons than the public utility distributions. Differences in the crude and standardized rates therefore reflect the increased weight given to rates yielded by the public utility employees in the younger age groups.

The age-standardized frequency and disability rates for each sex are generally increasing over the 5 years, the severity rates tending to decrease. Among males the 1944 frequency of 1,795.9 absences per 1,000 is 52 percent higher than the rate for 1940–44 (1,181.8), and is almost twice the corresponding rate for 1940 (902.5). Among females the 1944 frequency of 3,109.2 is 32 percent above the rate for 1940–44 (2,354.3), and 83 percent above the corresponding rate for 1940 (1,698.6).

Less spectacular increases are shown for the standardized disability rates, the average annual number of days lost per male in 1944 being 28 percent above the disability rate for 1940–44, while the corresponding percentage excess for the females is 17.

Age changes in rates.—Variation in the morbidity rates with age is presented graphically in figure 2 for each sex and year. In general

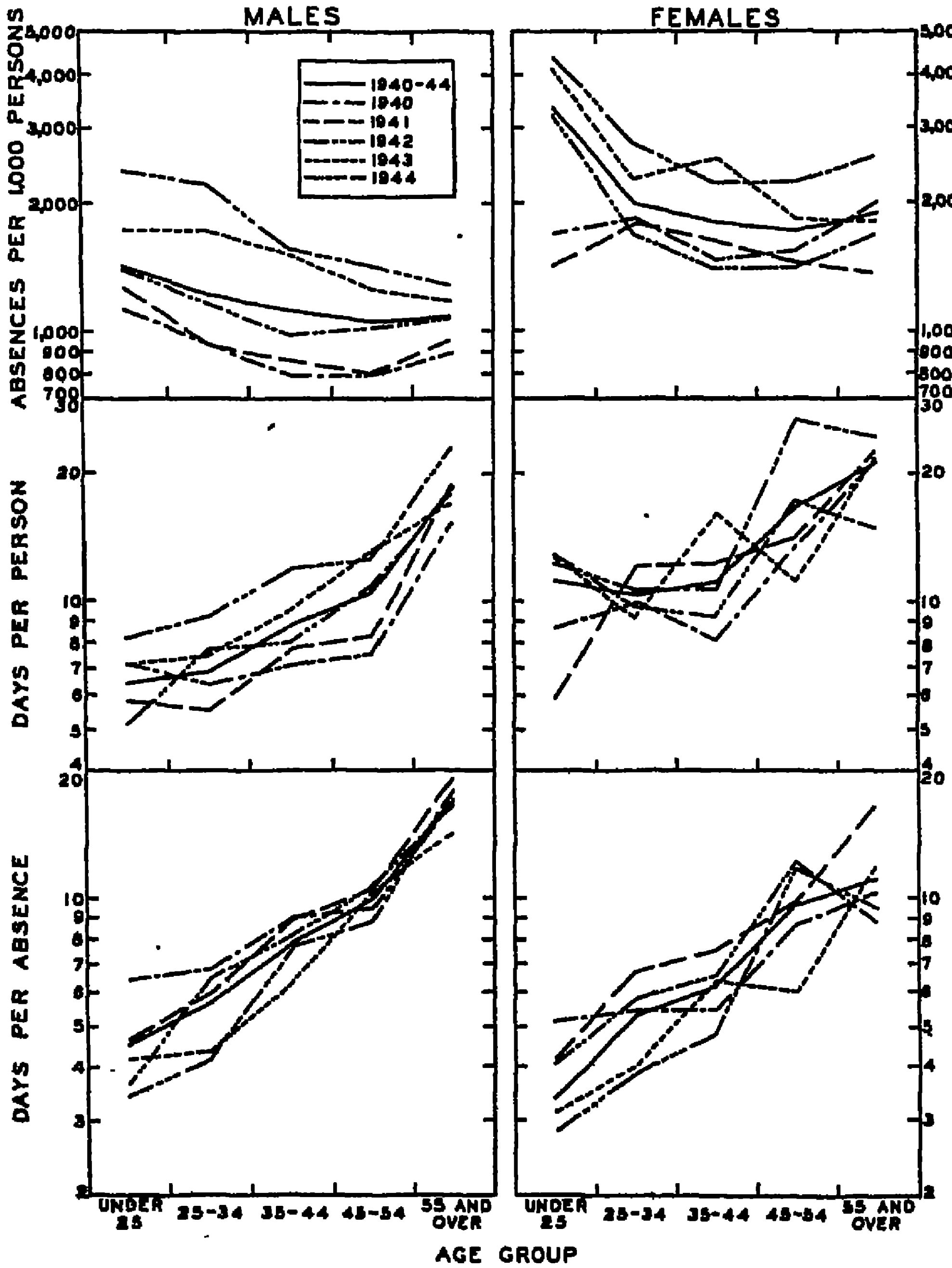

FIGURE 2.—Age changes in morbidity rates by sex and year in which absence ended; experience of male and female employees in a public utility, 1940–44, inclusive. (Logarithmic vertical scale.)

it will be observed that the frequency of 1-day or longer disabilities among both males and females tends to decrease with increasing age. For the 5-year period, 1940–44, the rates for males drop from 1,426.0 absences per 1,000 under 25 years of age to 1,053.0 absences per 1,000 for males 45–54 years of age, rising slightly to 1,083.6 for males in the oldest age group. Among females the rates for the 5-year period decrease with age from 3,328.4 absences per 1,000 females under 25 to 1,718.9 absences per 1,000 females 45–54 years of age, the female frequency also rising slightly in the oldest age group.

Although absence frequency tends to decrease with age, the average duration of absence, reflecting the severity of disability, rises sharply, and results in an upward trend with age in the number of days lost per person. For the 5-year period the days lost per male increase from 6.4 for the group under 25 to 18.5 for the group 55 years of age and over, the average number of days per absence rising from 4.5 to 17.1; among females approximately 11 days were lost per female in each of the three youngest age groups, the rate increasing to 16.7 for females 45–54 years of age, and to 21.1 for those 55 and over, the average duration of absence rising steadily with increasing age from 3.3 to 11.2 days.

For the 5-year period as a whole, the frequency and disability rates for males in each age group were consistently lower than the corresponding rates for females, the severity rates being higher among the males.

MORBIDITY AMONG MALES BY AGE AND CAUSE

The data for males are sufficiently extensive to permit determination of frequency, disability, and severity rates by age group and year for three broad sickness groups. The rates are given in table 3, and are presented graphically in figure 3.

Time changes in rates.—Age-standardized rates given in table 3 disclose a generally increasing absence frequency for each broad sickness group throughout the 5-year period, the disability rates for the respiratory and nonrespiratory-nondigestive diseases also tending to increase with time. Particularly notable is the 1944 frequency of respiratory diseases, representing, on the basis of the age distribution of employed males in the United States in 1942, an average for the year of one disabling respiratory illness per male.

It will be observed in figure 3 that in many instances the 1943 and 1944 frequency rates for males in specific age groups are also relatively high. While corresponding respiratory frequencies for the 2 years are not conspicuously different, the 1944 rates for the digestive and nonrespiratory-nondigestive groups of diseases are well above the corresponding rates for 1943. The 1944 frequency of nonrespiratory-nondigesitve diseases for males under 25 years of age is unusually

TABLE 3.—*Morbidity rates for three broad sickness groups by age and year in which absence ended; experience of male employees in a public utility, 1940–44, inclusive* [1]

Year in which absence ended	Respiratory diseases							Digestive diseases							Nonrespiratory-nondigestive diseases [2]						
	All ages [3]		Age group					All ages [3]		Age group					All ages [3]		Age group				
	Crude	Standardized [4]	Under 25	25–34	35–44	45–54	55 and over	Crude	Standardized [4]	Under 25	25–34	35–44	45–54	55 and over	Crude	Standardized [4]	Under 25	25–34	35–44	45–54	55 and over
Average annual number of absences per 1,000 males																					
1940–44	690.8	713.6	830.6	762.2	707.4	621.1	624.7	195.0	213.9	309.2	241.2	188.9	164.7	154.4	171.3	171.1	159.5	130.6	151.3	191.9	239.7
1940	477.4	500.9	649.4	525.3	445.7	447.8	426.9	154.1	168.4	246.8	182.2	143.7	110.8	154.7	165.6	165.7	110.4	137.0	187.7	187.8	277.9
1941	559.6	596.7	789.8	605.5	529.1	492.3	563.0	146.2	163.4	261.1	160.7	147.1	106.5	137.3	128.8	128.4	95.5	96.1	116.3	143.5	207.3
1942	643.2	685.4	910.8	748.3	592.2	570.5	588.7	192.9	211.0	318.5	224.0	181.8	162.5	160.6	168.3	160.8	95.5	119.8	151.5	204.0	253.5
1943	943.2	960.3	977.3	1,149.6	1,057.9	793.2	753.9	204.9	239.5	352.3	329.6	203.9	159.3	125.7	177.0	180.0	204.5	152.4	162.5	194.9	193.7
1944	935.5	1,003.4	1,000.0	1.372.5	991.6	811.7	753.6	303.7	377.2	538.5	549.0	283.1	284.8	189.6	231.9	298.6	615.4	200.0	196.7	231.0	265.4
Average annual number of days per male																					
1940–44	3.557	3.498	2.808	2.835	3.494	3.290	5.386	1.380	1.393	1.498	1.162	1.515	1.229	1.594	3.592	3.371	0.714	1.343	2.020	4.365	9.691
1940	2.507	2.489	2.409	2.253	2.585	2.759	2.467	1.484	1.670	2.273	1.342	1.434	.990	2.444	2.865	2.972	.786	1.423	1.830	3.265	8.630
1941	3.279	3.346	2.682	2.502	3.225	2.941	5.801	1.059	1.097	1.280	.707	1.450	.701	1.375	3.071	3.159	.548	1.275	1.849	3.204	10.224
1942	3.126	3.256	3.051	2.385	2.705	2.758	5.808	1.457	1.454	1.261	1.425	1.419	1.141	2.099	3.502	3.330	.401	1.174	1.912	5.161	9.304
1943	4.483	4.320	3.148	4.427	4.817	3.304	5.940	1.087	1.049	1.114	.848	1.304	1.144	.806	3.908	3.368	.920	1.047	1.990	6.317	7.725
1944	4.841	4.502	3.058	4.227	4.395	4.608	6.540	1.871	1.709	1.231	1.722	2.006	2.169	1.363	4.908	4.216	1.596	2.094	2.591	4.060	12.223
Average number of days per absence																					
1940–44	5.15	4.90	3.38	3.72	4.94	5.30	8.62	7.08	6.51	4.85	4.82	8.02	7.46	10.32	20.97	19.70	4.47	10.28	13.35	22.75	40.43
1940	5.25	4.97	3.71	4.29	5.80	6.16	5.78	9.63	9.92	9.21	7.36	9.97	8.94	15.80	17.30	17.94	7.12	10.39	13.29	17.38	31.05
1941	5.86	5.61	3.40	4.13	6.10	5.97	10.30	7.24	6.71	4.90	4.40	9.85	6.58	10.02	23.84	24.60	5.73	13.27	15.91	22.32	49.32
1942	4.86	4.75	3.35	3.19	4.57	4.83	9.97	7.55	6.89	3.96	6.36	7.81	7.02	13.07	20.80	20.71	4.20	9.80	12.62	25.30	36.70
1943	4.75	4.50	3.22	3.85	4.55	4.24	7.88	5.30	4.38	3.16	2.57	6.40	7.18	6.42	22.58	18.71	4.50	6.87	12.25	32.41	39.88
1944	5.17	4.49	3.06	3.08	4.43	5.68	8.68	6.16	4.53	2.29	3.14	7.08	7.62	7.19	21.16	14.12	2.59	10.47	13.18	17.58	46.05

[1] The number of days of disability is the number of calendar days from the date absence began to the date absence ended, or to the 372d day, inclusive.
[2] Includes ill-defined and unknown causes.
[3] Includes a negligible number of absent persons of unknown age.
[4] Age-standardized according to estimates of male employment in the United States for the week ending June 13, 1942 (*11*).

NOTE.—The number of person-years of exposure is given in table 1.

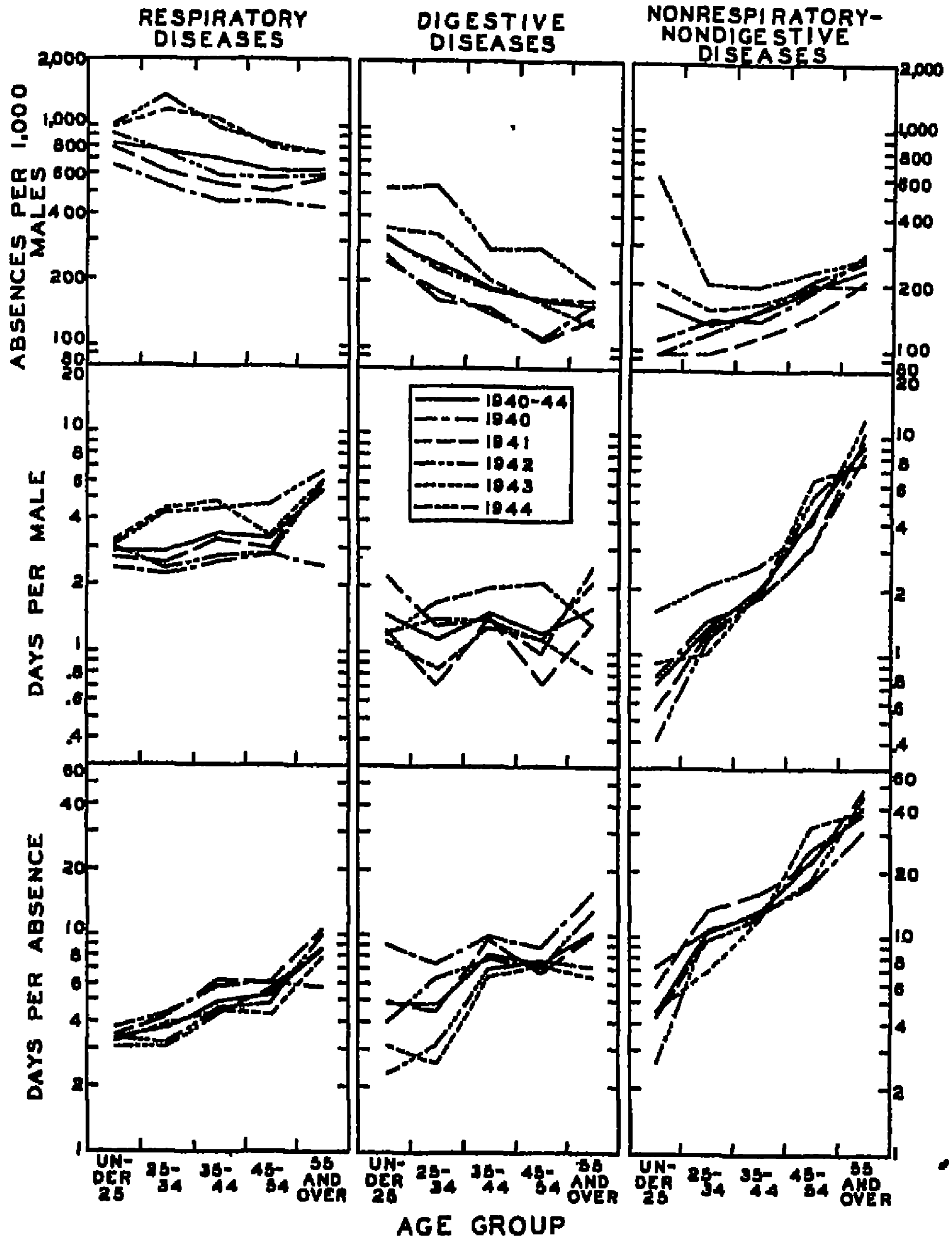

FIGURE 3.—Age changes in morbidity rates for three broad sickness groups by year in which absence ended; experience of male employees in a public utility, 1940-44, inclusive. (Logarithmic vertical scale.)

high since the absences yielding this rate include 18 attacks of malaria suffered by one individual.

Age changes in rates.—In spite of the yearly variation in the rates for a particular age and sickness group, figure 3 reveals, in general, certain clearly defined age trends. To facilitate a comparison of these trends, figure 4 presents the rates for the 5 years combined for each broad sickness group and for all causes. The following discussion is based primarily on figure 4, but the relationships are also valid for a number of the individual years.

Over half of the disabilities recorded for males in any age group is attributed to respiratory illness, the curve of the frequency rates paralleling the curve of the rates for all causes, and tending to decrease with increasing age. A decrease with age, but at a more rapid rate, is also shown in the frequency of digestive diseases. The behavior of the frequency of nonrespiratory-nondigestive diseases is unique in that the rate increases from 130.6 for males 25–34 years of

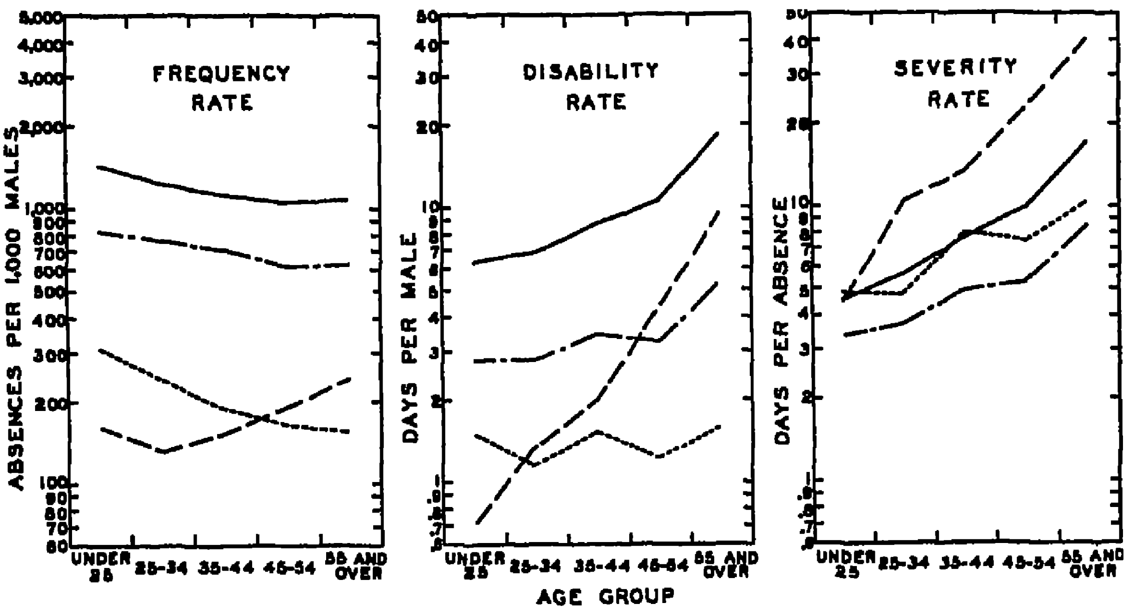

FIGURE 4.—Age changes in morbidity rates for three broad sickness groups; experience of male employees in a public utility, 1940-44, inclusive. (Logarithmic vertical scale.)

age to 239.7 for males 55 and over. For males under 45 the digestive diseases ranked second to the respiratory in frequency, but for males in the two oldest age groups, the nonrespiratory-nondigestive diseases assumed second place.

The nonrespiratory-nondigestive disability rates reveal an even more striking change with age, rising from 0.7 day per male for the group under 25 years of age to 9.7 days per male for the group 55 and over. For the youngest age group these diseases caused less lost time than either of the other two sickness groups, accounting for less than 15 percent of the total time lost by males under 25. For males 45 and over, on the other hand, the nonrespiratory-nondigestive diseases resulted in more days of disability than either of the other two sickness groups, accounting for more lost time among males 55 and over than all other causes of disability combined.

The severity rates for each sickness group tend to increase with age, the rates for the nonrespiratory-nondigestive diseases again exhibiting the most rapid rise. The respiratory group of diseases yielded the shortest average absence duration for males in each age group, while with the exception of the group under 25 the longest average duration of absence was recorded for the nonrespiratory-nondigestive diseases.

MORBIDITY AMONG MALES BY AGE AND DURATION

A further investigation of age changes in frequency and duration of disability is made possible by the use of table 4 which presents for males the frequency of absences due to all causes disabling for 1 to 3 days, 4 to 7 days, and 8 days or longer. The rates are shown graphically in figures 5 and 6.

TABLE 4.—*Frequency of absences due to sickness and injuries disabling for 1 to 3 calendar days, 4 to 7 calendar days, and 8 calendar days or longer, by age and year in which absence ended; experience of male employees in a public utility, 1940–44, inclusive*

Year in which absence ended	Average annual number of absences per 1,000 males						
	All ages [1]		Age group				
	Crude	Standardized [2]	Under 25	25–34	35–44	45–54	55 and over
	Absences of 1–3 calendar days						
1940–44	681.7	738.5	1,034.5	810.7	667.4	606.3	539.4
1940	454.2	491.2	707.8	513.3	414.3	393.2	418.3
1941	480.7	534.7	853.5	575.3	442.5	385.8	395.0
1942	666.5	722.6	1,031.8	816.0	588.4	598.7	552.1
1943	870.1	975.8	1,386.4	1,180.0	922.9	728.3	575.9
1944	1,003.1	1,318.8	1,961.6	1,796.1	1,053.0	935.1	718.0
	Absences of 4–7 calendar days						
1940–44	267.9	266.2	253.3	272.2	276.0	250.3	278.3
1940	248.7	251.1	259.7	277.9	222.2	245.6	249.3
1941	258.0	264.3	299.3	248.2	269.3	239.2	266.1
1942	238.4	242.9	254.8	230.9	237.3	220.5	276.1
1943	341.9	317.7	181.8	376.7	374.6	308.5	335.1
1944	264.2	255.0	211.5	266.6	288.7	240.5	263.0
	Absences of 8 calendar days or longer						
1940–44	182.8	177.1	138.2	129.9	173.9	196.4	265.9
1940	155.9	160.2	149.4	139.7	147.3	147.7	229.2
1941	157.7	158.4	108.3	106.2	143.5	163.6	296.9
1942	170.8	164.8	121.0	125.0	159.1	199.0	236.6
1943	209.1	197.2	159.1	152.4	208.0	218.6	261.8
1944	237.7	222.1	211.5	145.1	2[illegible]1.8	254.8	298.6

[1] Includes a negligible number of absent persons of unknown age.
[2] Age-standardized according to estimates of male employment in the United States for the week ending June 13, 1942 (*11*).

NOTE.—The number of person-years of exposure is given in table 1.

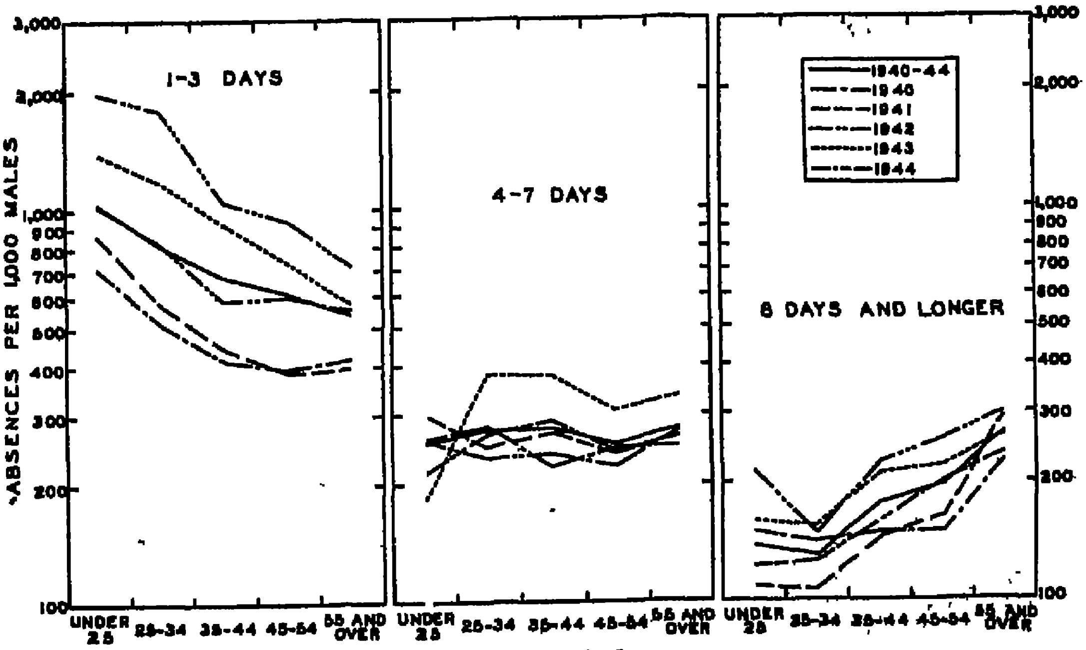

FIGURE 5.—Age changes in frequency of absences due to sickness and injuries disabling for 1 to 3 calendar days, 4 to 7 calendar days, and 8 calendar days or longer, by year in which absence ended; experience of male employees in a public utility, 1940–44, inclusive. (Logarithmic vertical scale.)

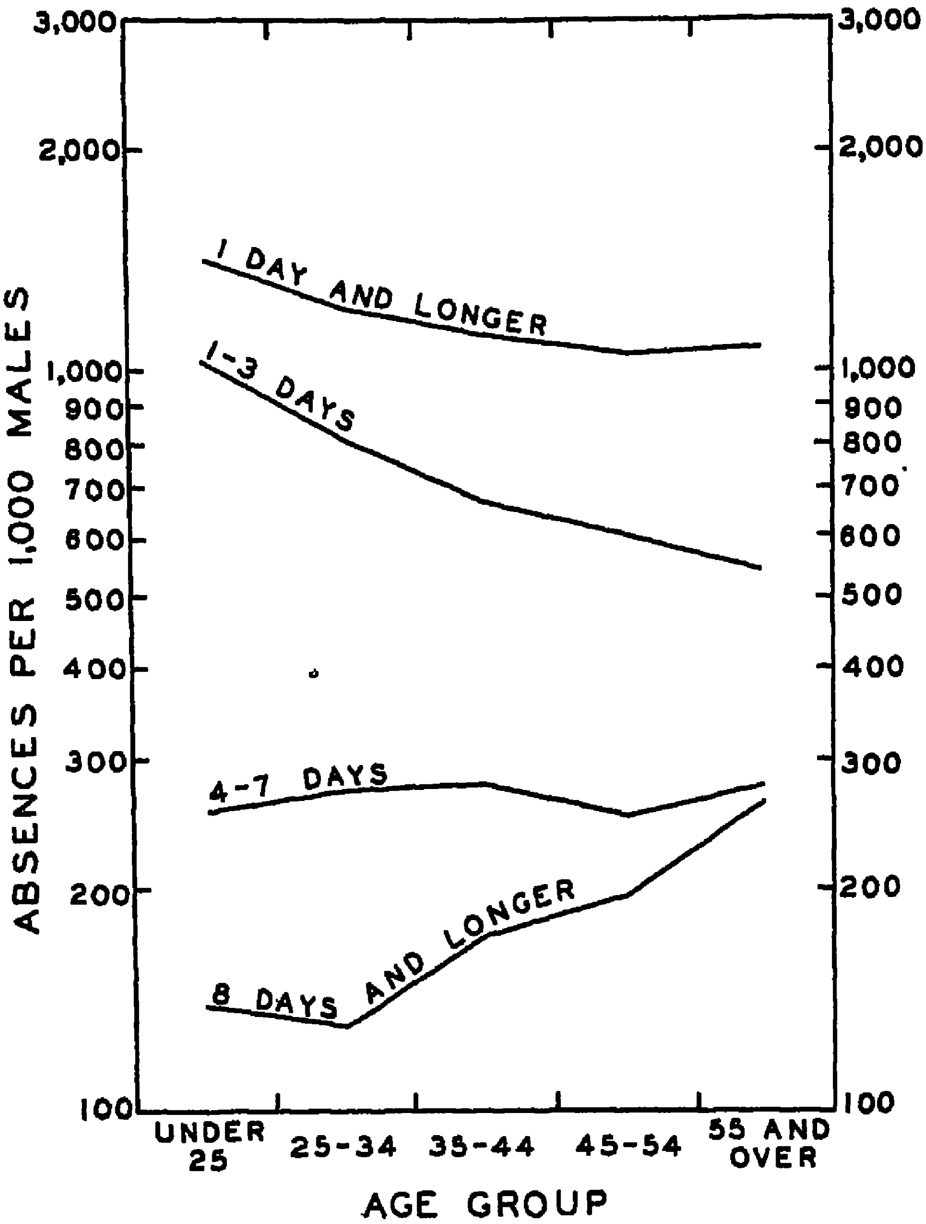

FIGURE 6.—Age changes in frequency of absences due to sickness and injuries disabling for 1 to 3 calendar days, 4 to 7 calendar days, and 8 calendar days or longer; experience of male employees in a public utility 1940–44, inclusive. (Logarithmic vertical scale.)

Time changes in rates.—Age-standardized frequency rates given in table 4 reveal that increases in the male rate previously observed for disabilities of 1 day or longer reflect primarily increases in the frequency of 1–3-day absences, the 1944 rate being over two and one-half times the corresponding rate for 1940.

With the exception of the 1940 and 1941 rates for the two oldest age groups, the five annual age curves shown in figure 5 for absences of 1 to 3 days are distinct, each curve lying above the one for the preceding year. Attention is directed to the fact that the greatest relative increase with time is recorded for males in the two youngest age groups, while the smallest relative increase is shown for males 55 years of age and over.

Age changes in rates.—An examination of figures 5 and 6 discloses differing age trends for absences of each duration group. For absences of 1 to 3 days, denoting relatively slight severity of disability, the frequencies decrease with advancing age, the rate of decrease being

somewhat more rapid than the corresponding rate of decrease shown for absences of all durations. The frequency of absences of 4 to 7 days' duration, indicating disability of moderate severity, remains relatively level throughout the age span, while the frequency of more serious illness disabling for 8 days or longer tends to increase with age. These findings are in harmony with the results of an earlier study covering age changes in the disability experience of the company for the years 1922–24, inclusive (*2*).

It will be observed in figure 6 that although the order of the three frequencies is the same for each age group, the relative magnitude of the rates varies with changing age. For males under 25 years of age the frequency of absences of 1 to 3 days is approximately four times the rate for absences of 4 to 7 days, and over seven times the rate for 8-day or longer absences. For males 55 years of age and over the rate for absences of 1 to 3 days is only twice the rate for either of the other two duration periods, the frequency of absences of 8 days or longer approaching in magnitude the frequency of absences of 4 to 7 days.

COMMENT

An examination of the crude annual rates for all ages raises the question of the factors responsible for the relatively high frequency and disability rates experienced in recent years. In the absence of additional information reference might be made to a number of possible factors, such as a shift in the age distribution of the exposed population, or some other change in the wartime composition of the employed group. The availability of information on age permits the investigation of the operation of some of these factors.

Factors affecting male employees.—The five annual age distributions reveal notable changes occurring in the age composition of the exposed males, beginning principally in 1942. Between January 1 of that year and December 1 of the following year the company lost 20 percent of its male employees, the number on the payroll dropping from 2,682 to 2,155. The number of males under 35 years of age decreased in the same period from 792 to 319, representing a drop of 60 percent, while the number of males 35 and over changed from 1,890 to 1,836, or a decrease of only 3 percent.

Nevertheless the changing age composition of the male employees does not appear to be responsible for the relatively high frequency rates experienced in 1943 and 1944. Among the public utility workers the frequency of 1-day or longer absences due to sickness and injuries tended to decrease rather than to increase with age. If the absence frequency for males in each age group had remained constant over the 5-year period, the increasing contribution of the older workers would have resulted in a total rate tending to decrease with time. Thus the age-standardized rate for each year, based on the summation of age-specific rates weighted according to the relatively younger distribution of employed males in the United States in 1942, is higher than the corresponding crude rate. Furthermore, for males in each age group the frequency of 1-day or longer absences was increasing over the 5-year period, the 1944 rate being relatively more excessive for the younger males. The age-standardized rates, giving greater weight to the rates for younger males, show a relatively greater increase with time than do the corresponding crude rates. It appears therefore that some factor or factors apart from the age composition of the exposed population, and possibly originating in the war emergency effected the increased frequency rates for males in recent years.

It is of interest to speculate on the reasons for the greater susceptibility of the younger males to these adverse factors. It seems plausible that the 60-percent decrease occurring in the number of males under 35 years of age during the war years may represent the loss of the more physically fit members of the group, the remaining men constituting an adverse selection from the standpoint of physical condition.

The time changes in the annual disability rates for males of all ages result principally from the increasing number of absences, since any increase in frequency tends to be accompanied by increases in the total time lost. In the instance of the male workers the percentage increase in the disability rates is less than the corresponding increase in frequency, since the rising absence frequency reflects primarily increases in absences of relatively short duration, namely, those of 1 to 3 days.

The age factor, however, cannot be disregarded in a consideration of time lost. Although absence frequency tended to decrease with advancing age, an upward trend was shown in the annual number of days lost per male. In recent years the shifting age composition of the exposed population gives greater weight to the rates yielded for the older males, and some part of the increase in the disability rate may be attributed to the increased contribution of the older group. Thus the 1944 disability rate, unadjusted for age, is 74 percent above the corresponding rate for 1940, while the percentage excess for the age-standardized rates is 50.

Factors affecting female employees.—The total number of females remained relatively stable throughout the 5 years, but a noteworthy reversal occurred in the proportions in the two groups under 35 years of age. The number of females under 25 doubled in the 2 years from January 1942 to December 1943, a large increase occurring in the number under 20 years of age. The group of females 25 to 34 years of age, on the other hand, was decreasing throughout the 5-year period, the number on the pay roll in December 1943 being less than half the number on the pay roll in January 1940.

Among females in each age group the frequency of absences increased in recent years, possibly indicating the presence of adverse factors during the war. Nevertheless the unusually high rates among females under 25 years of age in 1942–44 may be affected to a great extent by the relatively large group of females under 20 years of age who entered the company in those years and being inexperienced found, perhaps, some difficulty in becoming adjusted to the routine of business life. In general for both males and females this factor of adjustment may be an effective one in determining the decrease with age in the frequency of minor disabilities.

SUMMARY

An analysis is presented of the 1-day or longer disability experience of male and female employees of a public utility company for the 5 years 1940–44. Variation in three basic morbidity rates is examined in respect of a number of variables, particular attention being given to the age factor. The results may be briefly summarized as follows:

(1) During the 5 years the total number of male-years of exposure decreased from 2,700 in 1940 and 1941 to less than 2,100 in 1944, reflecting primarily marked decreases in the number of males under 35 years of age.

(2) Frequency and disability rates, standardized for age, were generally increasing over the 5-year period for both males and females, the severity rates tending to decrease.

(3) Time-changes in the frequency rates were relatively greater than time-changes in the disability rates since the increased absence frequencies reflect principally an increased number of absences of relatively short duration.

(4) In general, the frequency of 1-day or longer absences for both males and females decreased with advancing age, but the relative severity of disability, as indicated by absence duration, increased, resulting in an upward trend with age in the annual number of days lost per person.

(5) For the 5-year period as a whole the frequency and disability rates for males in each age group were lower than the corresponding rates for females, the severity rates being higher among males.

(6) Over half of the disabilities recorded for males in any age group was accounted for by respiratory illness. For males under 45 the digestive diseases ranked second in frequency, while for males 45 and over the nonrespiratory-nondigestive diseases assumed second place.

(7) The nonrespiratory-nondigestive diseases constituted the only sickness group among males revealing an upward trend with age in absence frequency. Days lost per male from these causes showed a spectacular rise with age increasing from 0.7 day for the group under 25 years of age to 9.7 days for the group 55 and over.

(8) The severity rates for each sickness group tended to increase with age, the rates for the nonrespiratory-nondigestive diseases showing the most rapid rise.

(9) The respiratory group of diseases yielded the shortest average absence duration for males in each age group while, with the exception of the group under 25 years of age, the longest average duration was recorded for the nonrespiratory-nondigestive group of causes.

(10) Although the frequency of 1-day or longer absences generally decreased with age, an upward trend was shown in the frequency of the more serious illnesses disabling for 8 calendar days or longer.

ACKNOWLEDGMENTS

Acknowledgment is made to the Boston Edison Company for forwarding for many years to the Industrial Hygiene Division monthly reports from which the disability data were obtained for this and the other papers of the series. Data for the determination of the annual age distributions of the employees were also made available through the courteous cooperation of the company. Thanks are due particularly for their continuous interest and cooperation to Mr. A. J. McEachern, Industrial Relations Manager; Doctor Noel G. Monroe, Medical Director, and Miss Marion L. Godfrey of the Industrial Relations Department. Acknowledgment should also be made to Miss Elizabeth S. Frasier of this Division who processed the raw data on employee age and determined the initial annual age distributions from these data.

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DENTAL CARIES EXPERIENCE IN RELOCATED CHILDREN EXPOSED TO WATER CONTAINING FLUORINE [1]

I. INCIDENCE OF NEW CARIES AFTER 2 YEARS OF EXPOSURE AMONG PREVIOUSLY CARIES-FREE PERMANENT TEETH

By HENRY KLEIN, *Senior Dental Officer, United States Public Health Service*

In the course of systematic dental examination of persons of Japanese ancestry residing in War Relocation Authority centers, two groups of children at two different centers were examined in the summer of 1943 and again in the summer of 1945.[2] Early in 1942 both groups, because of their Japanese ancestry, had been transferred with

[1] From the Division of Public Health Methods.

[2] The first examination findings in 1943 were collected in the control locality by Dr. S. T. Ichiyasu and in the fluoride locality by Dr. T. T. Okuno; all second examinations in 1945 were collected by Dr. Toyohara Shimizu, dental officer, Office of Indian Affairs, U. S. Department of the Interior, to whom the author wishes to express his appreciation. Acknowledgment is also made to Dr. Elias Elvove, senior chemist, U. S. Public Health Service, for the water analysis.

their parents from homes in Los Angeles and environs to an assembly center near Los Angeles. In the autumn of 1942 they were again transferred, 120 to a center in California and 196 to Arizona.

The children relocated to the California center consumed fluoride-free water originating from melted snows coming off a precipitous mountain rising to a height of more than 14,000 feet, less than 20 miles from the residence area. Analysis of this water revealed a fluorine content of 0.1 p. p. m., a value within the error of measurement. The children relocated to the Arizona center consumed water originating from two deep wells drilled through the desert floor to a depth of approximately 400 feet. This water contained fluorine to the extent of 3 p. p. m. Water from the central source was piped to each family apartment in both centers.

Because of the relatively high fluorine content of the water in the Arizona center, an attempt was made by the Relocation Authority to remove the fluorides. Bone-meal filters were installed only at selected water outlets to which the population had to travel to obtain fluoride-free drinking water. After a trial of several months, treatment of the water in this manner was discontinued. Bottled fluorine-free waters were shipped into the center and sold to residents who reserved such water chiefly for the preparation of dietary formulae for infants. The children of school age obtained their drinking water from the nearest tap, which provided water containing fluorine (except during the 3-month period mentioned above, when fluorine-free water could be obtained, if so desired, at several selected outlets).

In the early summer of 1943, the school children were examined with the aid of dental mirrors and explorers; the same children were reexamined 2 years later in the summer of 1945. All examinations were recorded by the methods previously utilized in the Hagerstown Dental Studies.[3] During the 2-year interval, the children were restricted to their respective centers, since movement in and out was controlled by military authority. Their diets were quite similar and adequate.

Analysis of the dental findings obtained in 1943 and in 1945 reveals that a fluorine content of 3 p. p. m. in the drinking water is associated with a marked reduction in new caries in teeth present in the mouth and free of caries at the beginning of exposure.

FINDINGS

During the 2-year interval between 1943 and 1945, the 196 children were exposed to fluoride water in the Arizona Relocation Center and 120 consumed fluoride-free water in the California center. Distribution by sex and age is shown in table 1.

[3] See "A procedure for the recording and statistical processing of dental examination findings": Klein, Henry, and Palmer, C. E.: J. Dent. Res., 19: 243 (1940).

TABLE 1.—*Number of permanent teeth free of dental caries experience among 316 children examined in 1943 in 2 relocation centers, by age and sex*

Sex	Water [1]	Age in years, summer 1943							
		8	9	10	11	12	13	14	All ages
		Number of children							
Boys	Fluoride group	14	17	21	12	12	12	7	95
	Control group	4	10	4	10	8	6	10	52
Girls	Fluoride group	17	15	14	9	20	13	13	101
	Control group	7	9	10	7	13	13	9	68
		Number of caries-free permanent teeth, 1943							
Boys	Fluoride group	49	134	217	160	202	243	153	1,158
	Control group	16	69	32	126	131	115	222	711
Girls	Fluoride group	88	123	155	137	342	274	323	1,442
	Control group	25	81	118	87	226	280	204	1,021
		Number of caries-free permanent teeth per child, 1943							
Boys	Fluoride group	3.5	7.9	10.3	13.3	16.8	20.3	21.9	[2] 13.4
	Control group	4.0	6.9	8.0	12.6	16.4	19.2	22.2	[2] 12.8
Girls	Fluoride group	5.2	8.2	11.1	15.2	17.1	21.1	24.9	[2] 14.7
	Control group	3.6	9.0	11.8	12.4	17.4	21.5	22.7	[2] 14.1

[1] The water at the Arizona center contained 3 p. p. m. of fluorine; that at the California center was fluorine free.
[2] Arithmetic average of 7 age-specific rates (8–14 years).

At the time of the first examination in 1943, the boys as well as the girls of the two areas were quite similar with regard to the number of caries-free permanent teeth present in the mouth. The boys and girls destined to reside in the fluoride area had an average of 13.4 and 14.7 caries-free permanent teeth, respectively, and the boys and girls in the control area, *12.8* and *14.1* (fig. 1).

After a 2-year residence in their respective areas, the 2 groups of children showed a marked difference in the number of teeth newly attacked by caries (see table 2 and fig. 2). For example, in the fluoride area, boys who were 8 years old in 1943 developed about 22 new DMF (decayed, missing, or filled) teeth per 100 caries-free permanent teeth present in the mouth at the first examination in 1943. In contrast, boys of the same age in the control area developed about 44 new DMF teeth per 100 caries-free permanent teeth. The corresponding values for girls 8 years old in 1943 were: 15 DMF for the fluoride group, and 36 DMF for the control group.

As shown in figure 2, the absolute differences in incidence of new caries between the fluoride and control groups tend to diminish with advancing age for both the girls and the boys. The differences became small and variable beginning at about 12 years of age in boys and at about 11 years of age in girls. In the fluoride area new caries was inhibited to a greater extent in the younger children—those 8,

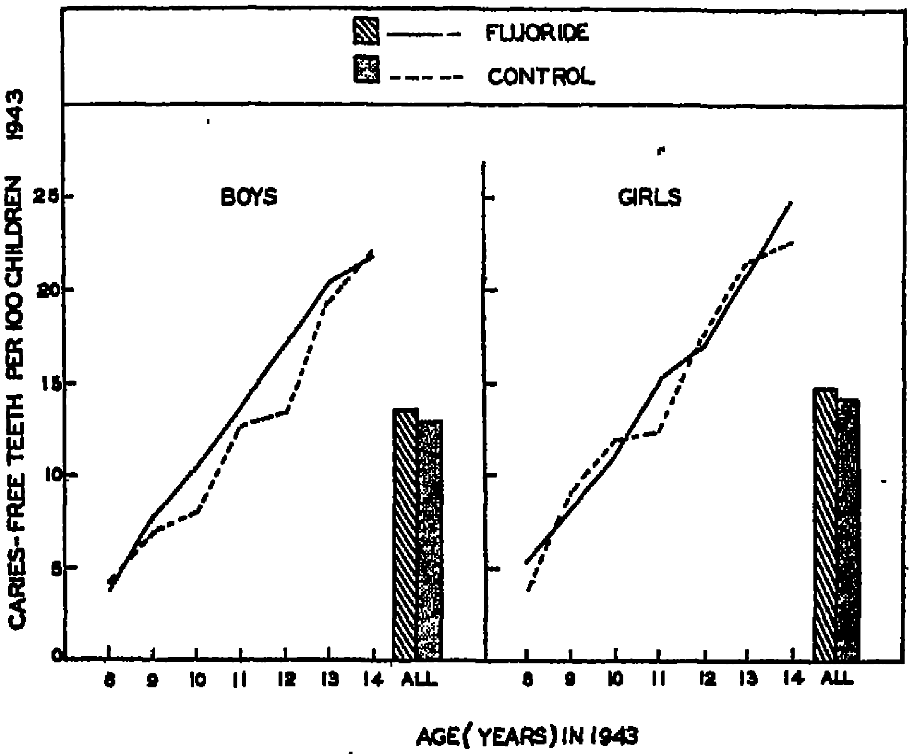

FIGURE 1.

TABLE 2.—*Number of permanent teeth free of dental caries experience in 1943 that showed evidence of caries experiences in 1945 among 316 children in 2 relocation centers, by age and sex*

Sex	Water [1]	8	9	10	8–10	11	12	13	14	All ages
		Number of caries-free permanent teeth, 1943								
Boys	Fluoride group	49	134	217	400	160	202	243	153	1,158
	Control group	16	69	32	117	126	131	115	222	711
Girls	Fluoride group	88	123	155	366	137	342	274	323	1,442
	Control group	25	81	118	224	87	226	280	204	1,021
		Number of teeth unaffected 1943 but affected 1945								
Boys	Fluoride group	11	18	25	54	14	20	18	31	137
	Control group	7	23	12	42	28	8	13	28	119
Girls	Fluoride group	13	20	13	46	20	42	25	35	168
	Control group	9	23	32	64	12	30	49	43	198
		Number of teeth affected 1945 per 100 teeth unaffected 1943								
Boys	Fluoride group	22.4	13.4	11.5	[2] 15.8	8.8	9.9	7.4	20.3	[3] 13.4
	Control group	43.8	33.3	37.5	[2] 38.2	22.2	6.1	11.3	12.6	[3] 23.8
Girls	Fluoride group	14.8	16.3	8.4	[2] 13.2	14.6	12.3	9.1	10.8	[3] 12.3
	Control group	36.0	28.4	27.1	[2] 30.5	13.8	13.3	17.5	21.1	[3] 22.5

Age in years, summer 1943 (columns 8 through All ages)

[1] The water at the Arizona center contained 3 p. p. m. of fluorine; that at the California center was fluorine-free.
[2] Arithmetic average of 3 age-specific rates (8–10 years).
[3] Arithmetic average of 7 age-specific rates (8–14 years).

9, and 10 years of age when first exposed to fluoride. In the fluoride group, boys 8 to 10 years of age at the time of the first examination developed in the subsequent 2-year period an average of about 16

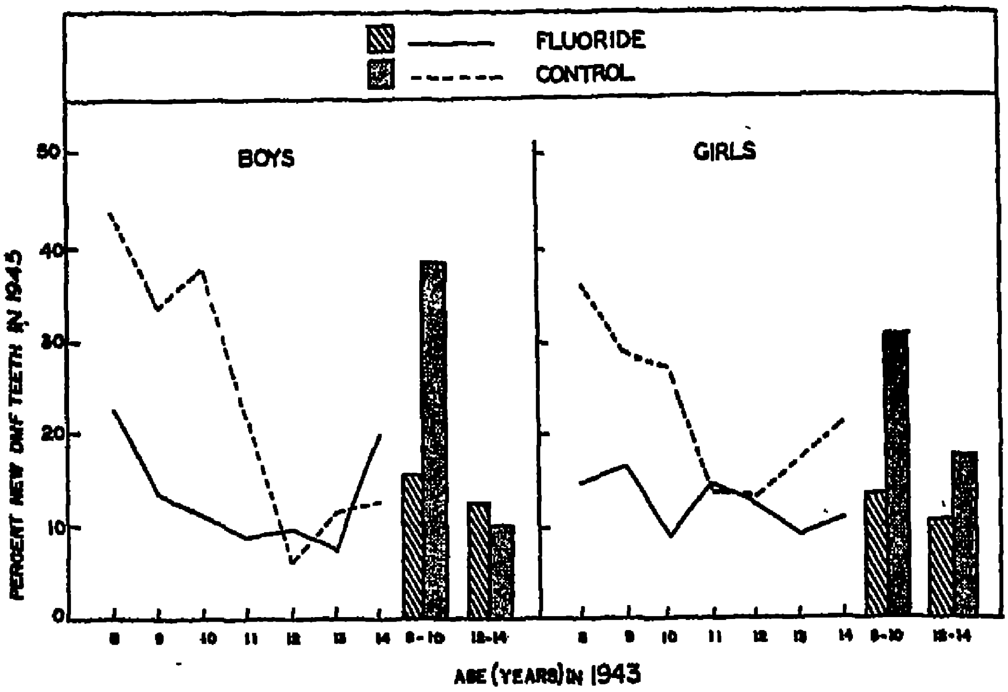

FIGURE 2.

new DMF teeth per 100 caries-free teeth present in 1943. Boys of similar age in the control group developed over twice as many new DMF teeth (38.2). Girls 8 to 10 years of age showed nearly the same results, averaging in the fluoride group about 13 new DMF teeth per 100 previously unaffected as compared with about 30 such teeth in the control group. Caries incidence in children who were over 11 years of age in 1943 was not affected significantly by either the presence or absence of fluorine in drinking water.

These findings lead to the conclusion that, among young children (ages 8 to 10 years) transferred to an area where the drinking water contained 3 p. p. m. of fluoride, the incidence of new caries experience in previously noncarious erupted teeth was reduced approximately 60 percent below that which would be expected on the basis of the incidence observed in the control group. The data are sufficient to indicate that exposure of the erupted permanent teeth of younger children to fluoride waters provides a larger measure of protection against caries than does the same exposure of the erupted teeth of older children. It follows therefore that, among teeth present in the mouth at the beginning of exposure to fluorine, those most recently erupted were those most protected against caries attack.[4]

The findings reported here are not intended to constitute an endorsement for addition of as much as 3 p. p. m. of fluorine to community water supplies for the purpose of reducing caries incidence. However, the data provide information showing that addition of

[4] Since the present report was prepared, a communication by R. Weaver (see Brit. Dent. J., 47: 185 (1944)) has become available. This worker has arrived at similar conclusions from prevalence observations on 800 English children who had immigrated into an area where the drinking water contained 1.4 p. p. m. of flourine. The significance of these findings with regard to the individual (different) types of teeth will be discussed in the next paper in this series of reports.

small amounts of fluorine to community water supplies deficient in this element effects a reduction in caries incidence in the erupted permanent teeth of residents of school age; and that such caries inhibition is most noticeable in the erupted teeth of the younger children.

MALARIA

Numbers of Cases Reported by State Health Officers, January–June, 1945, as Compared With Data for the Same Period 1939–44 [1]

In the accompanying table, an attempt has been made to record separately for the first 6 months of 1944 and 1945 cases of malaria in which the infection was acquired within and outside continental United States. At the time of publication of a similar report for the first 4 months of 1945 and certain prior years [2] information regarding the origin of infection in cases for 1944 was not available. This has now been furnished for several States in the Annual Summaries, and the period has been extended to cover the first half year. The figures for the years 1939 through 1942 may be considered as cases in the civilian population contracted within the United States; those for 1943 probably include a few cases in the military population, in which the infection was acquired outside the United States. For both 1944 and 1945, cases stated to be in the military are considered as having been contracted outside the United States. In less than one-tenth of 1 percent of the malaria cases reported among Army personnel in the United States during the first six months of 1945 the infection was stated to have been acquired in the United States.

In tabulating the data for the first 6 months of 1944, it was necessary to prorate the differential distribution for some States [3] with respect to origin of the case on the basis of the totals for the year. The separation of most of the cases according to the origin of the infection was made in the annual reports for 1944 but not in the monthly reports on which this note is based, Therefore, while the distribution by origin for the first 6 months of 1944 is approximate in such instances, it is believed that the proportional figures may be considered reasonably accurate for all practical purposes. In cases where the information regarding the origin of infection was not furnished or was not determinable, by the above method of allocation the figures have been recorded in the column headed "Information not supplied."

For the first 6 months of 1945 most of the State health officers

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[1] From the Division of Public Health Methods.

[2] Public Health Reports, August 31, 1945, pp. 1019–1021.

[3] New York, Ohio, South Carolina, Georgia, Florida, Kentucky, Mississippi, Texas, Arizona, and California.

Number of cases of malaria reported by the State health officers, January–June, inclusive, 1945, and comparison with the same months of certain prior years [1]

Division and State	1939	1940	1941	1942	1943	1944				1945			
						Total	Place contracted			Total	Place contracted		
							Within continental United States	Outside continental United States	Information not supplied		Within continental United States	Outside continental United States	Information not supplied
New England:													
Maine	0	0	0	1	0	1	1	0		6	1	5	
New Hampshire	0	0	1	0	0	2	0	2			0	0	
Vermont	0	0	0	0	1		0	0		2	2	0	
Massachusetts	4	4	4	3	26	305	3	302		559	0	559	
Rhode Island	0	0	0	0	1	41			41	109	3	106	
Connecticut	1	5	6	0	5	33	1	32		57	7	50	
Middle Atlantic:													
New York	42	30	30	49	41	162	20	141	1	653	6	647	
New Jersey	6	1	4	8	4	210	5	205		790	9	781	
Pennsylvania	1	3	5	4	2	1			1		0	0	
East North Central:													
Ohio	2	6	5	3	16	70	21	49		20	2	18	
Indiana	6	4	2	0	72	215	58	157		470	5	465	
Illinois	56	85	23	29	27	11			11	2	2	0	
Michigan	11	25	7	76	143	153	14	139		188	1	77	110
Wisconsin	0	2	0	0	7	20	1	19		150	0	150	
West North Central:													
Minnesota	4	1	1	1	0	21			21	46	0	46	
Iowa	1	30	1	0	5	26			26	250	2	248	
Missouri	13	24	24	9	53	39	8	31		229	25	204	
North Dakota	0	0	0	0	2		0	0		1	1	0	
South Dakota	0	0	0	0	0	7	0	7			0	0	
Nebraska	0	0	1	0	0	2	0	2		1	1	0	
Kansas	9	8	6	5	2	38	8	30		542	4	538	
South Atlantic:													
Delaware	0	0	0	0	0		0	0		82	0	82	
Maryland	2	1	3	4	9	7	2	5		441	3	438	
District of Columbia	0	0	0	0	31	46	0	46		113	0	113	
Virginia	34	35	28	15	35	258	11	247		525	1	398	126
West Virginia	1	2	3	4	0	2	2	0		93	1	92	
North Carolina	259	75	55	122	104	117			117	195	59	52	84
South Carolina	4,030	3,142	3,028	2,839	3,210	3,741	3,367	374		4,377			4,377
Georgia	937	521	360	249	185	189	137	52		369	195	174	
Florida	144	55	53	17	41	152	7	145		545	13	532	

East South Central:													
Kentucky	28	9	12	8	12	277	12	176	89	775	28	747	--------
Tennessee	282	366	131	69	66	37	37	--------	--------	86	40	46	--------
Alabama	1,412	1,178	865	970	1,072	710	522	188	--------	1,150	800	350	--------
Mississippi	18,507	18,378	11,858	12,538	9,943	8,858	8,681	177	--------	7,789	7,499	290	--------
West South Central:													
Arkansas	1,483	1,065	843	565	319	444	--------	--------	444	830	468	362	--------
Louisiana	282	95	148	103	91	400	881	19	--------	881	823	558	--------
Oklahoma	537	526	541	369	563	412	883	29	--------	545	539	6	--------
Texas	1,307	2,156	2,675	2,520	3,251	3,040	2,806	234	--------	4,164	2,666	1,498	--------
Mountain:													
Montana	3	1	0	1	0	18	0	18	--------	9	3	6	--------
Idaho	0	0	0	2	2	2	--------	--------	2	--------	0	0	--------
Wyoming	0	0	1	1	1	8	2	6	--------	5	0	5	--------
Colorado	0	0	0	1	9	25	0	25	--------	574	1	573	--------
New Mexico	8	12	9	8	2	4	4	0	--------	35	4	31	--------
Arizona	14	17	6	14	9	19	2	15	2	75	3	72	--------
Utah	0	1	0	1	36	35	0	35	--------	87	1	86	--------
Nevada	0	0	0	0	0	4	--------	--------	4	--------	0	0	--------
Pacific:													
Washington	0	1	1	0	2	8	0	8	--------	2	0	2	--------
Oregon	5	4	8	8	11	248	7	241	--------	38	3	35	--------
California	71	58	70	42	411	899	29	534	336	1,003	24	979	--------
Total	24,502	22,976	20,827	20,584	19,822	21,312	16,532	3,685	1,095	28,813	12,745	11,371	4,697

[1] In the table published in the PUBLIC HEALTH REPORTS for Aug. 31, 1945 (p. 1020), the figures for 1944 were taken from the monthly reports, in which information regarding origin of infection was not available. The figures used here are from the *Annual Summaries* for 1939, 1942, and 1944; for the other years, they are from the monthly reports, which, although provisional, will agree fairly closely with the final annual summaries in most instances.

have reported cases in their monthly reports either as requested (i. e., contracted within and contracted outside the United States), or have furnished the information separately for the military and civilian populations. The figures for cases in which the infection was reported to have been acquired outside the United States, or which were stated to have occurred in the military, may be compared with the confidential figures furnished by the Army; such a comparison indicates that some States are not receiving complete reports of such cases or are not reporting them to the Public Health Service.

No information is furnished in these reports as to the numbers of cases that are original infections and the numbers that are relapses. Probably many of the cases reported in the civilian population early in the year are relapses, while a larger proportion of those reported during the summer and fall are probably original infections. Also, in comparing the figures prior to 1942 with these for later years, consideration should be given to the possible effect, on reporting, of the withdrawal of large numbers of physicians for duty in the armed services. This may have resulted in proportionately fewer cases of malaria being seen and therefore reported by physicians during recent years.

The figures as reported by the State health officers indicate that there has been no increase in indigenous malaria in the United States during the first 6 months of 1945, even when the numbers of cases for which the origin is not stated are combined with those for cases reported as having acquired the infection in this country. Many of the States reported fewer such cases during the first half of 1945 than for the same period during the years 1939 to 1942, e. g., New York, Illinois, Kansas, Georgia, Florida, Tennessee, Alabama, Mississippi, Arkansas, Texas, Arizona, and California. A few States reported a slightly higher incidence during the first 6 months of 1945 than in earlier years, namely, Rhode Island, Connecticut, New Jersey, Louisiana, Kentucky, and Montana; but several of these States reported fewer than 10 cases during that period.

While these provisional figures for the first half of 1945 indicate a decrease for the country as a whole in malaria cases acquired in the United States as compared with the years 1939 to 1942, final conclusions with respect to the relative situation in the several States will have to await more nearly complete reports and possibly the consideration of changes in the composition of the population, as well as other factors.

It may be of interest to note that during the years 1939 to 1941, inclusive, approximately 70 percent of the cases of malaria were reported during the second half of the year. A report for the whole of 1945 will be prepared as soon after the end of the year as the monthly reports from the States are available.

DEATHS DURING WEEK ENDED NOVEMBER 10, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 10, 1945	Corresponding week, 1944
Data for 91 large cities of the United States:		
Total deaths	8,888	8,531
Average for 3 prior years	8,563	
Total deaths, first 45 weeks of year	399,302	400,404
Deaths under 1 year of age	598	576
Average for 3 prior years	611	
Deaths under 1 year of age, first 45 weeks of year	27,045	27,700
Data from industrial insurance companies:		
Policies in force	67,298,659	66,882,764
Number of death claims	11,112	11,875
Death claims per 1,000 policies in force, annual rate	8.6	9.3
Death claims per 1,000 policies, first 45 weeks of year, annual rate	10.0	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

For the country as a whole the incidence of poliomyelitis declined during the week. A total of 255 cases was reported, as compared with 329 last week, 289 for the corresponding week last year, and 205 for the 5-year (1940–44) median. Increases occurred in 6 of the 10 States reporting more than 7 cases each, as follows (last week's figures in parentheses): *Increases*—Massachusetts 18 (14), New Jersey 12 (9), Ohio 12 (7), Missouri 25 (5), Texas 10 (9), Washington 14 (13); *decreases*—New York 18 (34), Pennsylvania 5 (19), Wisconsin 18 (53), California 38 (44). The cumulative total is 12,926, as compared with 18,491 for the corresponding period last year and a 5-year median of 9,200.

A total of 107 cases of meningococcus meningitis was reported, as compared with 104 last week and a 5-year median of 64. Of the current total, 46 cases occurred in 5 States, as follows: New York 10 Pennsylvania and Illinois 8 each, Texas 9, and California 11. The total to date is 7,314, as compared with 14,985 for the corresponding period last year, and a 5-year median of 3,103.

Of the total of 4,146 cases of influenza, as compared with 2,837 last week, 1,863 for the corresponding week last year and 1,769 for the 5-year median, 3,155 cases (76 percent of the total) were reported in 4 States, as follows (last week's figures in parentheses): Virginia 400 (159), South Carolina 842 (506), Alabama 278 (21), Texas 1,635 (1,609). For the corresponding week last year these same States reported an aggregate of 1,529 cases, or 82 percent of the total.

Delayed information from Iowa reported 246 cases of undulant fever, dates of occurrence not stated. Total cases reported to date for the country as a whole, 4,457 as compared with 3,549 for the same period last year.

Two cases of anthrax were reported during the week, one each in New York and New Jersey.

Deaths recorded for the week in 93 large cities of the United States totaled 8,836, as compared with 8,974 for the preceding week, 9,143 for the corresponding week last year, and a 3-year (1942–44) average of 9,147. The total to date is 411,700 as compared with 412,743 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 17, 1945, and comparison with corresponding week of 1944, and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944	
NEW ENGLAND												
Maine	17	1	1	------	------	------	1	0	92	0	0	1
New Hampshire	0	0	0	------	------	------	9	20	4	0	2	0
Vermont	0	0	0	------	------	------	0	2	3	1	0	0
Massachusetts	4	2	3	------	------	------	160	83	219	1	7	7
Rhode Island	0	2	1	4	14	------	0	2	2	0	0	0
Connecticut	1	0	0	1	------	1	9	13	13	3	7	0
MIDDLE ATLANTIC												
New York	7	13	12	[1] 2	[1] 1	[1] 5	88	44	207	10	27	12
New Jersey	1	4	4	3	5	5	12	13	20	2	12	2
Pennsylvania	6	10	12	6	1	1	295	33	222	8	18	4
E. NORTH CENTRAL												
Ohio	67	14	16	12	8	8	12	11	21	6	14	3
Indiana	24	10	11	109	3	9	4	8	17	3	1	1
Illinois	7	3	18	3	4	7	159	24	34	8	10	4
Michigan [2]	11	17	9	------	------	2	125	8	117	4	13	5
Wisconsin	3	4	2	167	12	26	23	9	116	3	2	2
W. NORTH CENTRAL												
Minnesota	10	11	4	------	------	------	11	6	21	3	2	0
Iowa	32	9	4	4	------	1	9	3	28	4	0	0
Missouri	13	12	12	10	1	1	21	0	4	2	9	2
North Dakota	4	7	2	10	------	------	7	0	4	0	1	1
South Dakota	5	1	1	------	------	------	0	10	4	0	1	0
Nebraska	3	1	1	11	18	3	3	14	5	0	2	0
Kansas	9	4	6	------	------	3	8	7	9	2	3	0
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	0	1	1	1	1	1
Maryland [2]	13	8	8	3	4	4	5	3	21	2	3	3
District of Columbia	0	0	1	------	3	1	0	2	1	0	1	0
Virginia	44	12	25	400	205	160	28	8	55	1	3	3
West Virginia	19	1	8	91	17	17	63	11	24	2	1	0
North Carolina	82	34	49	------	2	3	7	7	24	1	1	1
South Carolina	28	5	18	842	302	302	52	1	5	1	1	1
Georgia	23	27	27	53	18	34	4	1	8	0	3	2
Florida	11	20	16	4	------	2	1	9	8	2	2	0
E. SOUTH CENTRAL												
Kentucky	16	7	11	5	1	1	86	3	11	1	4	1
Tennessee	44	8	15	45	5	26	1	14	15	2	7	4
Alabama	38	34	25	278	29	53	3	0	8	4	3	3
Mississippi [2]	28	27	18	------	------	------	------	------	------	1	0	1
W. SOUTH CENTRAL												
Arkansas	24	18	12	61	28	45	8	6	3	1	3	0
Louisiana	15	13	13	76	3	10	2	2	2	4	1	1
Oklahoma	12	22	22	81	43	43	1	1	2	0	1	0
Texas	79	80	58	1,635	993	716	45	16	41	9	12	0
MOUNTAIN												
Montana	9	1	3	6	12	1	10	3	7	0	0	0
Idaho	1	0	1	12	3	------	101	0	1	0	0	0
Wyoming	0	0	0	8	1	1	3	1	3	0	0	0
Colorado	7	4	11	113	11	80	5	6	22	1	1	0
New Mexico*	------	3	1	------	------	1	------	1	8	------	0	0
Arizona	2	5	5	55	55	84	1	1	8	0	0	0
Utah [2]	0	0	0	19	22	6	7	4	4	0	1	0
Nevada	0	0	0	------	------	------	0	1	1	0	0	0
PACIFIC												
Washington	4	19	6	------	------	------	210	30	30	1	2	1
Oregon	6	9	4	10	11	11	10	16	23	2	3	0
California	27	30	22	7	28	46	236	157	64	11	19	6
Total*	756	512	502	4,146	1,863	1,769	1,845	610	2,488	107	204	84
46 weeks*	15,507	11,729	13,452	92,578	852,351	177,884	113,911	597,762	561,941	7,314	14,985	3,103

[1] New York City only.
[2] Period ended earlier than Saturday.
*Exclusive of New Mexico figures for the current week; report not received.

Telegraphic morbidity reports from State health officers for the week ended November 17, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [2]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944		Nov. 17, 1945	Nov. 18, 1944	
NEW ENGLAND												
Maine	0	1	0	33	56	15	0	0	0	1	0	0
New Hampshire	0	0	0	4	25	9	0	0	0	0	2	0
Vermont	2	0	0	7	6	2	0	0	0	1	0	0
Massachusetts	18	13	1	92	175	175	0	0	0	2	1	1
Rhode Island	1	0	0	5	9	8	0	0	0	0	2	0
Connecticut	1	7	0	20	31	32	0	0	0	1	1	1
MIDDLE ATLANTIC												
New York	18	93	12	200	237	237	0	0	0	4	6	7
New Jersey	12	7	3	67	50	76	0	0	0	0	1	3
Pennsylvania	15	15	8	149	203	179	0	0	0	4	3	6
EAST NORTH CENTRAL												
Ohio	12	24	8	240	324	210	0	0	0	0	2	2
Indiana	2	4	4	58	77	77	0	2	2	5	3	1
Illinois	7	12	12	136	180	168	1	1	0	2	6	2
Michigan [1]	4	9	5	103	147	147	0	0	0	0	1	2
Wisconsin	18	5	4	76	94	113	0	2	1	0	1	0
WEST NORTH CENTRAL												
Minnesota	7	7	3	50	63	56	0	0	0	0	0	0
Iowa	6	1	1	50	41	51	0	0	0	4	2	2
Missouri	25	6	3	60	65	62	0	2	0	0	0	0
North Dakota	0	1	0	10	11	11	0	0	0	0	0	0
South Dakota	0	0	0	10	6	13	0	0	0	0	0	0
Nebraska	4	4	2	3	44	17	0	1	1	0	0	0
Kansas	0	1	2	69	84	83	0	1	0	0	0	0
SOUTH ATLANTIC												
Delaware	0	5	0	5	3	7	0	0	0	1	0	0
Maryland [1]	2	4	2	47	99	32	0	0	0	3	3	3
District of Columbia	5	1	0	12	17	13	0	0	0	0	0	0
Virginia	1	7	7	152	104	84	0	0	0	2	1	2
West Virginia	0	6	1	88	116	67	0	0	0	0	2	2
North Carolina	4	11	2	76	83	85	0	0	0	1	1	2
South Carolina	2	2	2	24	10	14	0	0	0	0	1	1
Georgia	1	3	1	24	40	43	1	0	0	6	2	3
Florida	0	0	1	6	7	7	0	0	0	0	2	2
EAST SOUTH CENTRAL												
Kentucky	1	4	3	61	62	54	0	0	0	0	6	6
Tennessee	6	0	2	77	88	88	1	0	0	3	5	5
Alabama	1	1	1	31	35	35	0	0	0	2	0	1
Mississippi [1]	4	0	2	37	20	15	1	0	0	0	0	3
WEST SOUTH CENTRAL												
Arkansas	1	1	0	12	30	13	3	0	0	0	8	4
Louisiana	1	0	1	30	10	10	0	0	0	4	2	8
Oklahoma	1	1	1	18	24	24	0	0	0	0	1	1
Texas	10	8	8	125	97	62	1	0	0	10	15	9
MOUNTAIN												
Montana	0	1	0	30	18	18	0	0	0	1	1	1
Idaho	1	0	0	15	19	8	0	0	0	0	0	0
Wyoming	0	0	1	1	11	8	0	0	0	1	0	0
Colorado	8	2	1	32	57	36	0	0	0	1	1	1
New Mexico*	------	0	0	------	14	8	------	0	0	------	0	2
Arizona	2	0	0	16	11	6	0	0	0	0	2	1
Utah [1]	1	0	1	15	15	19	0	0	0	0	0	0
Nevada	0	0	0	0	1	1	0	0	0	0	0	0
PACIFIC												
Washington	14	4	4	30	51	30	0	0	0	2	4	1
Oregon	4	4	4	26	34	16	0	0	0	0	2	0
California	38	14	14	223	233	146	0	0	0	4	1	2
Total*	255	289	205	2,655	3,243	2,651	8	9	9	65	91	95
46 weeks	12,926	18,491	9,200	156,527	109,078	121,998	312	353	707	4,581	5,046	6,303

[1] Period ended earlier than Saturday.

[2] Including paratyphoid fever reported separately, as follows: Vermont 1, Massachusetts 1, Indiana 1, Illinois 1, North Carolina 1, Georgia 3, Texas 1, Colorado 1, California 3.

*Exclusive of New Mexico figures for the current week; report not received.

Telegraphic morbidity reports from State health officers for the week ended April 14, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough			Week ended November 17, 1945							
	Week ended—		Median 1940–44	Dysentery			Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever endemic	Undulant fever
	Nov. 17, 1945	Nov. 18, 1944		Amebic	Bacillary	Unspecified					
NEW ENGLAND											
Maine	64	55	43	0	0	0	0	0	0	0	0
New Hampshire	15	23	1	0	0	0	0	0	0	0	1
Vermont	37	53	9	0	0	0	0	0	0	0	2
Massachusetts	130	122	158	0	4	0	1	0	0	0	0
Rhode Island	26	23	12	0	0	0	0	0	0	0	2
Connecticut	48	91	80	0	0	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	290	310	465	3	10	0	0	0	0	0	3
New Jersey	224	103	186	3	0	0	0	0	0	0	4
Pennsylvania	210	137	164	0	0	0	0	0	1	0	5
EAST NORTH CENTRAL											
Ohio	101	79	173	0	0	0	1	0	0	0	4
Indiana	31	16	28	2	0	0	0	0	0	0	1
Illinois	78	58	150	0	1	0	0	0	3	0	5
Michigan [3]	171	59	263	0	2	0	0	0	0	0	5
Wisconsin	102	59	188	0	0	0	0	0	0	0	3
WEST NORTH CENTRAL											
Minnesota	10	39	52	0	0	0	0	0	0	0	4
Iowa	7	4	17	0	0	0	0	0	0	0	3
Missouri	21	40	32	0	0	2	0	0	0	0	1
North Dakota	3	10	10	0	0	0	0	0	0	0	0
South Dakota	1	3	5	0	0	0	0	0	0	0	0
Nebraska	4	1	7	0	0	0	0	0	0	0	0
Kansas	23	38	49	0	0	0	0	0	0	0	1
SOUTH ATLANTIC											
Delaware	1	0	3	0	0	0	0	0	0	0	0
Maryland [3]	23	101	83	0	0	3	0	1	0	0	0
District of Columbia	2	7	7	0	0	0	0	0	0	0	0
Virginia	46	16	59	1	0	50	0	0	0	2	0
West Virginia	20	24	24	0	0	0	0	0	0	0	0
North Carolina	50	69	107	0	1	0	0	0	1	6	0
South Carolina	69	67	39	4	11	0	0	0	0	12	0
Georgia	12	3	10	1	1	0	0	0	0	35	2
Florida	3	7	7	0	0	0	0	0	0	4	1
EAST SOUTH CENTRAL											
Kentucky	45	5	68	0	1	0	0	0	1	0	0
Tennessee	39	12	23	0	0	5	0	0	0	5	0
Alabama	32	28	13	1	0	0	0	0	1	10	1
Mississippi [3]	------	------	------	0	0	0	0	0	0	4	1
WEST SOUTH CENTRAL											
Arkansas	2	30	11	0	2	0	0	0	2	0	0
Louisiana	2	0	2	0	0	0	0	0	0	10	2
Oklahoma	15	8	10	0	2	0	0	0	0	0	0
Texas	118	167	93	9	255	57	0	0	1	84	12
MOUNTAIN											
Montana	0	26	16	0	0	0	0	0	0	0	0
Idaho	18	0	5	0	0	0	1	0	0	0	0
Wyoming	3	17	8	0	0	0	0	0	0	0	0
Colorado	38	24	38	0	0	0	1	0	0	0	1
New Mexico*	------	0	9	------	------	------	------	------	------	------	------
Arizona	1	39	10	0	0	10	0	0	0	0	1
Utah [3]	10	12	21	0	0	0	0	0	0	0	0
Nevada	------	0	0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	38	23	57	0	0	0	0	0	0	0	0
Oregon	6	2	18	0	0	0	0	0	0	0	1
California	78	122	164	2	4	0	1	0	0	2	6
Total*	2,267	2,132	3,296	26	294	127	5	1	10	174	74
Same week, 1944	84,921	------	------	56	642	298	12	1	11	141	82
Average, 1942–44	2,802	------	------	41	486	139	12	[4] 1	10	[4] 91	------
46 weeks: 1945*	111,353	------	------	1,740	22,592	9,882	579	461	650	4,655	4,458
1944	84,921	------	------	1,668	21,685	8,181	589	451	500	4,669	3,549
Average, 1942–44	136,100	------	[4] 159,129	1,552	16,109	7,103	578	[4] 450	661	[4] 3,292	------

[3] Period ended earlier than Saturday.
[4] 5-year median, 1940–44.

*Exclusive of New Mexico figures for the current week; report not received.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 10, 1945

This table lists the reports from 87 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	0	0	----	0	0	0	0	0	6	0	0	[illegible]
New Hampshire:												
Concord	0	0	-----	0	0	0	0	0	0	0	0	[illegible]
Vermont:												
Barre	0	0	------	0	0	0	1	0	1	0	0	[illegible]
Massachusetts:												
Boston	2	0	------	0	7	0	11	4	22	0	2	[illegible]
Fall River	0	0	-----	0	0	0	0	0	4	0	0	[illegible]
Springfield	0	0	------	0	2	0	2	0	4	0	0	[illegible]
Worcester	0	0	-----	0	22	0	7	0	9	0	0	[illegible]
Rhode Island:												
Providence	0	0	------	0	0	0	5	0	4	0	0	[illegible]
Connecticut:												
Bridgeport	0	0	------	0	2	0	0	0	1	0	0	
New Haven	0	0	-----	0	0	0	5	0	0	0	0	[illegible]
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	4	0	0	0	7	0	0	1
New York	8	2	2	0	44	10	51	8	67	0	1	8
Rochester	0	0	------	0	1	1	1	7	6	0	0	1
Syracuse	0	0	------	0	13	0	0	0	17	0	0	1
New Jersey:												
Camden	0	0	------	0	0	0	0	1	1	0	0	
Newark	0	0	------	0	3	0	5	0	5	0	0	2
Trenton	0	0	------	0	0	0	1	0	0	0	0	
Pennsylvania:												
Philadelphia	2	0	3	0	11	2	21	0	34	0	1	6
Pittsburgh	0	0	------	2	2	4	6	3	15	0	0	
Reading	0	0	------	0	3	0	2	0	1	0	0	2
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	4	0	2	0	0	1	5	0	5	0	0	1
Cleveland	0	0	8	0	2	2	7	1	15	0	1	4
Columbus	1	0	------	0	1	1	4	0	16	0	0	
Indiana:												
Fort Wayne	0	0	------	1	0	0	2	0	0		0	
Indianapolis	2	0	------	0	0	1	5	0	10	0	0	1
South Bend	0	0	------	0	0	0	0	0	3	0	0	
Terre Haute	0	0	------	0	0	0	1	0	0	0	0	
Illinois:												
Chicago	0	0	----	0	116	7	18	5	49	0	0	[illegible]
Springfield	0	0	----	0	0	0	2	0	2	0	0	
Michigan:												
Detroit	4	0	----	1	21	1	10	1	39	0	0	[illegible]
Flint	0	0	------	0	6	0	5	0	1	0	0	
Grand Rapids	0	0	------	0	1	0	0	0	2	0	2	
Wisconsin:												
Kenosha	0	0	------	0	0	0	0	0	2	0	0	[illegible]
Milwaukee	0	0	------	0	1	1	0	3	9	0	0	
Racine	0	0	------	0	2	0	0	0	5	0	0	
Superior	0	0	------	0	1	0	0	0	3	0	0	
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	0	0	1	0	4	0	0	
Minneapolis	4	0	------	0	2	0	4	2	8	0	0	
Missouri:												
Kansas City	1	0	------	1	1	0	4	0	14	0	0	
St. Joseph	0	0	------	0	6	0	0	0	2	0	0	
St. Louis	1	1	2	1	6	1	7	11	10	0	0	

City reports for week ended November 10, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0	1	0	0	0	1	0	0	0
Nebraska:												
Omaha	1	0		0	1	0	2	2	4	0	0	0
Kansas:												
Topeka	0	0		0	1	0	0	0	5	0	0	0
Wichita	0	0		0	1	0	3	0	2	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0	0	1	3	0	1	0	0	2
Maryland:												
Baltimore	9	0		0	2	0	5	0	10	0	0	34
Cumberland	0	0		0	0	0	0	0	1	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	1	0	2	1	3	1	6	1	16	0	0	6
Virginia:												
Lynchburg	0	0		0	0	0	1	0	7	0	0	5
Richmond	2	0		0	0	1	2	2	6	0	0	1
Roanoke	0	0		0	1	0	1	0	0	0	0	0
West Virginia:												
Wheeling	0	0		0	0	0	2	0	2	0	0	0
North Carolina:												
Raleigh	0	0		0	0	0	1	0	0	0	0	1
Wilmington	1	0		0	0	0	0	0	1	0	0	0
Winston-Salem	1	0		0	0	0	1	0	3	0	0	6
South Carolina:												
Charleston	0	0	16	0	0	0	0	0	1	0	0	0
Georgia:												
Atlanta	0	0	3	0	0	0	3	0	2	0	0	1
Brunswick	0	0		0	0	0	1	0	0	0	0	0
Savannah	0	0		0	0	0	1	0	1	0	0	0
Florida:												
Tampa	0	0		0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	0	0	4	0	0	0	9	1	5	0	0	5
Nashville	3	0		0	1	0	1	1	2	0	0	6
Alabama:												
Birmingham	1	0	4	0	0	0	2	1	7	0	1	0
Mobile	3	0	1	2	0	1	0	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	1	0	0	0	1	0	1	0	0	0
Louisiana:												
New Orleans	8	0	1	1	0	1	3	5	9	0	3	0
Shreveport	0	0		1	0	0	2	0	3	0	0	0
Texas:												
Dallas	2	0		0	1	0	1	1	12	0	0	1
Galveston	0	0		0	0	0	1	0	1	0	0	0
Houston	3	0		0	0	1	1	0	2	0	3	0
San Antonio	0	0		0	1	0	5	0	0	0	1	2
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	0	0	0	0	0	0
Great Falls	0	0		0	1	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	0	0	0	0
Missoula	0	0		0	5	0	0	0	1	0	0	0
Idaho:												
Boise	0	0		0	0	0	0	0	0	0	0	0
Colorado:												
Denver	1	0	6	0	5	0	5	0	13	0	0	8
Pueblo	2	0		0	0	0	1	0	1	0	0	1
Utah:												
Salt Lake City	0	0		0	2	0	1	0	6	0	0	0

City reports for week ended November 10, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	2	0	------	0	60	2	3	0	6	0	0	12
Spokane	0	0	------	0	1	0	3	1	6	0	0	11
Tacoma	1	0	------	0	25	0	0	1	1	0	0	6
California:												
Los Angeles	2	0	5	0	7	3	5	10	42	0	2	8
Sacramento	1	0	------	0	3	0	1	0	3	0	0	2
San Francisco	0	0	------	0	60	2	6	8	12	0	1	1
Total	75	3	60	12	462	45	278	80	600	0	18	703
Corresponding week, 1944	81	------	52	26	172	------	357	------	717	0	9	438
Average, 1940-44	91	------	88	[1] 25	[2] 560	------	[1] 353	------	678	1	19	887

[1] 3-year average, 1942-44.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: Boston, 3; New York, 4; Los Angeles, 1.
Dysentery, bacillary.—Cases: New York, 71: Chicago, 1: Wilmington, Del., 1: Charleston, S. C., 6: Los Angeles, 4; San Francisco, 1.
Dysentery, unspecified.—Cases: Cincinnati, 1; Richmond, 1.
Tularemia.—Cases: Little Rock, 1.
Typhus fever.—Cases: New York, 3; Atlanta, 8; Savannah, 5; Tampa, 3; Memphis, 1; Birmingham, 5; Mobile, 4; Little Rock, 1; New Orleans, 14; Galveston, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 87 cities in the preceding table (estimated population, 1943, 33,863,900)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.7	0.0	0.0	0.0	95	0.0	88.8	11.5	146	0.0	5.7	218
Middle Atlantic	4.6	0.9	2.3	1.4	37	7.9	40.3	8.8	71	0.0	0.9	113
East North Central	6.7	0.0	6.1	1.2	92	8.5	35.9	6.1	98	0.0	1.8	152
West North Central	17.8	2.2	4.5	4.5	42	2.2	46.8	33.4	111	0.0	0.0	31
South Atlantic	23.4	0.0	35.2	1.7	10	5.0	48.6	5.0	85	0.0	0.0	94
East South Central	41.3	0.0	53.1	11.8	6	5.9	70.8	17.7	89	0.0	5.9	65
West South Central	40.2	0.0	5.7	5.7	6	5.7	40.2	17.2	80	0.0	20.1	9
Mountain	23.8	0.0	47.7	0.0	103	0.0	55.6	0.0	167	0.0	0.0	72
Pacific	9.5	0.0	7.9	0.0	247	11.1	28.5	31.6	111	0.0	4.7	63
Total	11.6	0.5	9.3	1.9	71	6.9	42.9	12.4	93	0.0	2.8	109

TERRITORIES AND POSSESSIONS

Panama Canal Zone

Notifiable diseases—September 1945.—During the month of September 1945, certain notifiable diseases were reported in the Panama Canal Zone and terminal cities as follows:

Disease	Panama		Colon		Canal Zone		Outside the Zone and terminal cities		Total	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chickenpox	3		3		1				7	
Diphtheria	9				2		6	1	17	1
Dysentery:										
Amebic	1		1		1		11	1	14	1
Bacillary					2		1		3	
Malaria [1]	2		5		47	1	62	6	116	7
Measles	1		1		2		2		6	
Mumps	3				4		2		9	
Pneumonia		6		5	33			4	[2] 33	15
Relapsing fever							2		2	
Tuberculosis		15		9	6			5	[2] 6	29
Typhoid fever							1		1	
Whooping cough					1				[2] 1	

[1] 31 recurrent cases.
[2] Reported in the Canal Zone only.

Puerto Rico

Notifiable diseases—4 weeks ended November 3, 1945.—During the 4 weeks ended November 3, 1945, cases of certain notifiable diseases were reported in Puerto Rico as follows:

Disease	Cases	Disease	Cases
Bilharziasis	6	Ophthalmia neonatorum	2
Chickenpox	22	Poliomyelitis	1
Diphtheria	71	Puerperal fever	3
Dysentery, unspecified	7	Syphilis	385
Erysipelas	1	Tetanus	3
Filariasis	4	Tetanus, infantile	1
German measles	14	Tuberculosis (all forms)	456
Gonorrhea	271	Typhoid and paratyphoid fever	20
Influenza	236	Typhus fever	10
Malaria	636	Undulant fever	1
Measles	39	Whooping cough	56
Mumps	1		

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended October 27, 1945.—During the week ended October 27, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		10	1	86	151	39	66	73	88	514
Diphtheria		12	3	32	21	6		2		76
Dysentery, bacillary						4				4
German measles		1		3	13		1	3	6	27
Influenza		9			5	3				17
Measles		1	1	103	204	4	4	2	123	442
Meningitis, meningococcus		1	1		1	1				4
Mumps			5	100	43	16	2	57	28	251
Poliomyelitis					1					1
Scarlet fever	1	9	22	70	89	25	9	19	15	259
Tuberculosis (all forms)		10	16	110	54	26		29	34	279
Typhoid and paratyphoid fever			1	11	1			1		14
Undulant fever					1			1		2
Venereal diseases:										
Gonorrhea		29	5	144	193	59	29	40	53	552
Syphilis		9	3	128	150	11	10	11	32	354
Whooping cough		35		163	75	4		4	1	282

CHINA

Notifiable diseases—June 1945.—During the month of June 1945, certain notifiable diseases were reported by the Army Medical Administration, Health Department of the Board of Supplies and Transport, the Chinese Red Cross Medical Corps, and the National Health Administration of China, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	56	3	Relapsing fever	1,099	28
Cholera	1,730	359	Scarlet fever	21	
Diphtheria	55	4	Smallpox	111	13
Dysentery	3,320	53	Typhoid fever	624	39
Plague	14	6	Typhus fever	328	10

NEW ZEALAND

Notifiable diseases—4 weeks ended October 6, 1945.—During the 4 weeks ended October 6, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Lethargic encephalitis	1	1
Beriberi	1		Malaria	16	
Cerebrospinal meningitis	13	2	Poliomyelitis	4	1
Dengue	1		Puerperal fever	6	
Diphtheria	59	1	Scarlet fever	358	
Dysentery, bacillary	22		Tetanus	1	
Erysipelas	27		Trachoma	3	
Food poisoning	2		Tuberculosis (all forms)	218	59
Hookworm disease	1		Typhoid fever	13	1
Influenza	2	1	Undulant fever	3	
Lead poisoning	1				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Argentina—Santiago del Estero Province—Estacion Lavelle.—During the month of September 1945, 1 death from plague was reported in Estacion Lavelle, Santiago del Estero Province, Argentina.

Portugal—Azores.—During the week ended October 20, 1945, 11 cases of plague with 2 deaths were reported in the Azores, Portugal.

Smallpox

Angola.—For the month of August 1945, 118 cases of smallpox were reported in Angola.

Morocco (French).—For the period October 21–31, 1945, 178 cases of smallpox were reported in French Morocco, which includes cases reported by regions as follows: Agadir, 55; Casablanca, 40; Fez, 22; Marrakech, 22; Meknes, 10; Oujda, 7; Rabat, 22.

Typhus Fever

Egypt.—During the week ended October 20, 1945, 21 cases of typhus fever were reported in all of Egypt.

Morocco (French).—For the period October 21–31, 1945, 113 cases of typhus fever were reported in French Morocco, including cases reported in the following regions: Agadir, 8; Casablanca, 84; Fez, 10; Marrakech, 1; Meknes, 9; Rabat, 1.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

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DIVISION OF PUBLIC HEALTH METHODS

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Public Health Reports

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Public Health Reports

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APPARENT SEROLOGICAL HETEROGENEITY AMONG STRAINS OF TSUTSUGAMUSHI DISEASE (SCRUB TYPHUS)[1]

By IDA A. BENGTSON, *Senior Bacteriologist, United States Public Health Service*

Evidence of several different kinds indicates that a considerable degree of heterogeneity exists among strains of tsutsugamushi disease (scrub typhus) in contrast to the very uniform behavior of exanthematic (epidemic) and murine (endemic) strains of typhus fever. Differences in virulence have been found in laboratory animals. Of the five strains studied, Karp, Gilliam, Seerangayee, case 9 and Imphal,[2] the first four are more virulent for guinea pigs than is the Imphal strain. The Seerangayee strain is the most virulent, followed by the Gilliam and Karp strains. The Karp strain is usually more virulent for mice than the Gilliam strain as indicated by the higher titers and the greater regularity in the number of deaths of the mice in relation to the size of the dose, when graded dilutions of infected yolk-sac material are used as inocula. In the chick embryo the Karp, Seerangayee, and case 9 strains cause death of the embryo 9 to 12 days after inoculation into the yolk of infected yolk sac. This period may sometimes be reduced to 7 or 8 days. The Gilliam strain in contrast to the others causes death of the embryo earlier and sometimes kills in as short a time as 4 or 5 days. In general the Gilliam strain can be cultivated in the chick embryo more readily than the other strains. The complement-fixing response in the serum of guinea pigs inoculated with the Gilliam strain is greater than with other strains and higher titered serums are obtained. The Imphal strain is the least virulent of any of the strains. The incubation period in the egg is too long to allow the infection to develop sufficiently to kill the embryo before 21 days.

Differences in the virulence of the disease among humans as well

[1] From the Division of Infectious Diseases, National Institute of Health.

[2] The Karp strain from a New Guinea case of tsutsugamushi and the Seerangayee strain from Malaya were furnished to the National Institute of Health through the courtesy of Dr. R. Lewthwaite; the Gilliam strain was from the case of Dr. A. G. Gilliam at the Assam-Burma border; case 9 strain was from a case on New Guinea; and the Imphal strain came from India.

as among animals have been observed and commented upon by observers in the field. In certain localities a virulent type of disease with a high mortality occurs while in other regions symptoms of the disease are milder and the death rate is comparatively low.

Since reporting on a complement-fixation test for tsutsugamushi disease (scrub typhus) (*1*) in which the Karp strain was used in the preparation of antigen, further studies have been made in which the Gilliam strain as well as the Seerangayee and case 9 strains have been used as antigens.

The present study is designed to call attention to the lack of serological homogeneity among different strains of tsutsugamushi disease, particularly the Karp and Gilliam strains. The most accurate information regarding the relationship of strains can probably be obtained from a study of antiserums resulting from infection with known strains of virus. Therefore, in this study, the results obtained with serums from recovered guinea pigs employed in the passage of the various strains of the tsutsugamushi disease at the National Institute of Health and serums from cases of accidental laboratory infections are considered. The latter group of serums was from five different cases, three of which were infected with the Karp strain and two with the Gilliam strain.

THE COMPLEMENT-FIXATION TEST

The complement-fixation test employed in the serological study was performed as previously described (*2*). The reagents were used in 0.2-cc. amounts except the sensitized cells, 0.4 cc. of which was added. Two full units of complement were employed and fixation was carried out at 37° C.

PREPARATION OF ANTIGENS

Antigens were prepared from infected yolk sacs. Various methods of preparation have been tried, but the one found to give the most satisfactory results at the present stage has been one in which not too much effort has been made to obtain a highly purified product. A 33⅓-percent suspension of infected yolk sac containing numerous rickettsiae was made with 0.85-percent saline or with distilled water formalinized so that the final concentration of formalin was 0.1-percent. After grinding in a Waring blendor and standing overnight, the suspension was treated with one part of anhydrous diethyl ether and immediately centrifuged until a relatively clear layer of fluid separated between an upper layer of tissue and a precipitate of heavier particles in the bottom of the container. The fluid layer was siphoned or pipetted off and subjected to a further light centrifugation to remove any material which might be precipitated or rise to the surface. If this centrifugation is continued too long or if the ether

treatment is too prolonged, there is a certain amount of loss of antigenicity. It seems probable that there is also a gradual loss of antigenicity on storage of the antigen at refrigerator temperature. Tests for specificity have been made with epidemic and endemic typhus, Rocky Mountain spotted fever, lymphogranuloma venereum, psittacosis, and 100 syphilis serums. Negative results were obtained except in low dilutions with a few lymphogranuloma serums tested against the Gilliam antigen. Further slight centrifugation of the antigen removed the nonspecific substances.

Control lyophilized serums from recovered guinea pigs were employed regularly in all tests. All new antigens were tested against the control serums and when new control serums were prepared these were tested against an antigen which has been in use. Cross titrations using varying dilutions of control guinea pig serums beginning with one-fourth dilutions against varying amounts of antigen beginning with undiluted antigen have been made for the purpose of obtaining information as to the dose of antigen to be used in the testing of serums of unknown titer. Usually it was found that the Gilliam guinea pig antiserums were of relatively high titer while Gilliam antigens were of lower titer than Karp antigens. Karp guinea pig antiserums were of lower titer than the Gilliam antiserums (table 1).

TABLE 1.—*Titration of Karp and Gilliam antiserums against their homologous antigens*

KARP ANTISERUM

Karp antigen	Dilutions							
	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512
Undiluted	4	4	4	4	4	4	2	0
Diluted:								
1/2	4	4	4	4	4	4	1	0
1/4	4	4	4	4	4	4	Trace	0
1/8	4	4	4	4	4	4−	0	0
1/16	4	4	4	4	4	2	0	0
1/32	4	4	4	2	2	0	0	0
1/64	4	3	Trace	Trace	0	0	0	0
1/128	4−	Trace	0	0	0	0	0	0

GILLIAM ANTISERUM

Gilliam antigen	Dilutions									
	1/4	1/8	1/16	1/32	1/64	1/128	1/256	1/512	1/1024	1/2048
Undiluted	4	4	4	4	4	4	4	4	4	Trace
Diluted:										
1/2	4	4	4	4	4	4	4	4	4	0
1/4	4	4	4	4	4	4	4	4	4	0
1/8	4	4	4	4−	4−	1	4	4	4	0
1/16	4−	4−	2	1	0	0	0	0	0	0
1/32	1−	Trace	0	0	0	0	0	0	0	0
1/64	0	0	0	0	0	0	0	0	0	0
1/128	0	0	0	0	0	0	0	0	0	0

In order to obtain fixation with serums which might be low titered, e. g., serums containing only enough antibody to correspond with that contained in a 1/128 dilution of the Karp control serum or 1/1024 of the Gilliam control serum, the unit of antigen is placed at four times the dilution of antigen-giving fixation with the higher dilutions of control serum. In both of the above titrations the amount of antigen to be used would therefore be a one-half dilution. Lower titered antigens were used undiluted.

RESULTS WITH RECOVERED GUINEA PIG SERUMS

Graded dilutions of recovered guinea pig serums were tested against undiluted antigens and antigens diluted one-half. In all cases higher titers were obtained with the homologous strain. There was cross fixation among all strains and this was often directly proportional to the titer of the serum against the homologous strain (table 2).

TABLE 2.—*Titration of guinea pig antiserums against homologous and heterologous antigens*

Serum	Antigen	Titer
Karp (KS2)	Karp K122: Undiluted	1/256
	Diluted 1/2	1/256
	Gilliam G121: Undiluted	1/4
	Diluted 1/2	1/4
	Seerangayee S118: Undiluted	1/16
	Diluted 1/2	1/8
Gilliam (GS2)	Gilliam G121: Undiluted	1/2048
	Diluted 1/2	1/1024
	Karp K122: Undiluted	1/8
	Diluted 1/2	1/4
	Seerangayee S118: Undiluted	1/32
	Diluted 1/2	1/4
Seerangayee (SS1)	Seerangayee S118: Undiluted	1/128
	Diluted 1/2	1/128
	Karp K122: Undiluted	1/32
	Diluted 1/2	1/32
	Gilliam G121: Undiluted	1/32
	Diluted 1/2	1/32

In two other series of tests similar results were obtained (table 3).

TABLE 3.—*Titration of guinea pig antiserums against homologous and heterologous antigens*

Serum	Antigen	Titer
Series 1		
Karp KS1	Karp K90	1/256
	Gilliam Va8	1/32
	Seerangayee	1/16
Gilliam GS1	Gilliam Va8	1/4096
	Karp K90	1/64
	Seerangayee 101	1/16
Seerangayee SS1	Seerangayee	1/4096
	Karp K90	1/128
	Gilliam Va8	1/32
Series 2		
Case 9	Case 9 C58	1/2048
	Karp K28	1/128
	Gilliam G47	1/32
Gilliam	Gilliam G47	1/8192
	Karp K28	1/64
	Case 9 C58	1/8
Karp	Karp K28	1/512
	Gilliam G47	1/16
	Case 9 C58	1/128

RESULTS WITH SERUMS FROM LABORATORY INFECTIONS

Of the five cases of accidental laboratory infection from whom serums were obtained, two were infected with a hypodermic syringe needle and the strain was definitely known. The exact mode of infection of the other three is not known, but two of these patients had handled the Gilliam strain almost exclusively and the other one was presumably working with the Karp strain. The complement fixation test differentiates sharply between the two strains (table 4).

TABLE 4.—*Complement fixation results with serums from five cases of tsutsugamushi disease (scrub typhus)*

Case No.	Infecting strain	Sex	Specimen No.	Days after onset	Complement-fixation titer: Karp strain	Complement-fixation titer: Gilliam strain
1	Karp	M	10819	4	0	0
			10820	12	1/512	0
2	Gilliam	M	10842	4	0	0
			10843	8	1/16	1/32
			10844	12	1/64	1/65536
			10422	18	1/64	1/65536
3	do	M	10845	8	0	0
			10846	9	0	1/4
			10847	12	0	1/512
			10869	16	1/128	1/131072
			10423	19	1/128	1/262144
			10494	46	1/128	1/65536
			10503	49	1/64	1/65536
			11369	[1] 10	0	1/128
4	Karp	M	11351	1	0	0
			11352	6	1/8	0
			11353	11	1/1024	0
			11354	15	1/2048	1/8
			11355	24	1/2048	1/8
			11356	31	1/4096	1/8
5	do	F	11307	2	0	0
			11296	11	1/1024	0

[1] Months.

DISCUSSION

The present investigation suggests the occurrence of serological variations among strains of tsutsugamushi. All of the strains studied have common antigenic factors, but they fix complement in markedly higher dilutions with their homologous serums than with heterologous serums. The clear differentiation between the Karp and Gilliam strains, particularly in the complement-fixation tests of serums from cases of the human disease resulting from infection with known strains, point to the existence of at least two serological variants. In view of the low titers obtained with the heterologous strain it would appear advisable, as a disagnostic procedure, to employ both antigens in the testing of serums from suspected cases of the disease. Further detailed studies will be necessary to determine more accurately the relationship of the various strains and whether possibly other strains should also be included as test antigens in addition to the Karp and Gilliam strains. Incidentally, in this connection several groups of serums from cases of the disease occurring in different theaters of the Pacific

war area have been tested and all have yielded positive fixation against the Karp or Gilliam antigens.

Further purification, concentration, and standardization of the antigen is desirable, though the question of purification is apparently complicated by a certain instability of the antigenic substance and standardization by the relatively low potency of the antigens. However, with the antigens prepared as described, apparently conclusive results have been obtained in determining the presence of antibody and in differentiating strains. It is a question whether these results may be modified by further purification of the antigen.

The relationship of serological types to immunogenicity deserves further study. Topping (*3*) has shown that cross immunity exists in guinea pigs among the four strains studied: Karp, Gilliam, Seerangayee, and case 9. It remains to be determined whether a strain which fixes complement in higher dilutions than another also brings about a higher degree of immunity.

SUMMARY

Serums from guinea pigs inoculated with different strains of tsutsugamushi disease (scrub typhus) and serums from five cases of the disease accidentally infected with known strains when tested by complement fixation yielded markedly higher titers with the homologous strain than with heterologous strains. Infections with the Karp and Gilliam strains were clearly differentiated and therefore it is desirable that both antigens be employed in testing serums from cases of suspected illness.

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AN EPIDEMIC OF A SEVERE PNEUMONITIS IN THE BAYOU REGION OF LOUISIANA [1]

V. ETIOLOGY

By B. J. Olson, *Surgeon*, and C. L. Larson, *Passed Assistant Surgeon, United States Public Health Service*

An outbreak of severe pneumonitis occurred in the bayou region of southwestern Louisiana during the winter and spring of 1943–44. Nineteen known cases, eight of which terminated fatally, developed during the course of the outbreak. Epidemiological, clinical, and pathological studies were made jointly by the Louisiana State Board

[1] From the Division of Infectious Diseases, National Institute of Health.

of Health and the United States Public Health Service (*1, 2, 3, 4*). The results of these studies indicated the infectious nature and mode of spread, and defined the clinical and pathological characteristics of the disease in humans. This paper deals with the etiology of the disease.

METHOD OF STUDY

The initial study of cases was made by taking mice, guinea pigs, and monkeys to homes where the cases occurred and inoculating them with sputum or blood obtained directly from the patient. These animals were taken to an isolated laboratory building at the United States Marine Hospital in New Orleans for observation. Further materials were studied subsequently in both the New Orleans laboratory and at the National Institute of Health in Bethesda, Md.

COLLECTION OF MATERIAL

Ante mortem.—Sputum or throat washings were collected in sterile bottles. Portions of the specimens were inoculated directly into animals in most instances, while other portions were refrigerated. Some of the specimens were diluted with 30 percent glycerine. Whole blood was injected immediately into animals, and blood for transport to the laboratory was citrated and refrigerated in transit.

Post mortem.—Tissues from cases 17 and 18 were obtained at autopsy.

BACTERIOLOGICAL STUDIES

The autopsy material offered the best opportunity for detailed bacteriological studies. Specimens of liver, spleen, ascitic fluid, pleural fluid, brain, and pneumonic areas of the lung were cultured on blood agar plates and in thioglycollate broth. No pathogenic bacteria were isolated.

ISOLATION OF VIRUS

The virus was isolated from throat washings, sputum, and blood obtained from three patients during the course of illness and from autopsy material obtained from two fatal cases. The isolations were made in mice and guinea pigs in the New Orleans laboratory and in mice at the National Institute of Health laboratory. The material from which isolations were made, the methods of inoculation of the animals, and results obtained are given in table 1. As seen in this table, isolations were readily accomplished from throat washings, sputum, blood, and from autopsy specimens of lung and spleen. Typical examples of isolations from each type of material serve to illustrate the procedures used.

Throat washings from case 17 taken on the third day of illness were given intranasally to three mice on March 10, 1943. The mice died

TABLE 1.—*Isolation of virus responsible for an outbreak of Louisiana pneumonitis, showing materials and methods of inoculation*

Case No.	Material used as inoculum	Day of disease material was obtained	Isolations of virus in mice and guinea pigs		
			New Orleans laboratory		National Institute of Health
			Isolations in mice	Isolations in guinea pigs	Isolations in mice
16	Throat washings.	Ninth	+ intraperitoneal		
17	Throat washings.	Third	+ intranasal		
17	Sputum	Sixth	+ intranasal		+ intraperitoneal, intracerebral.
17	Blood	Sixth		+ intraperitoneal.	
17	Lung	Autopsy	+ intraperitoneal, intracerebral, and intranasal.	+ intraperitoneal.	+ intraperitoneal.
17	Spleen	Autopsy	+ intraperitoneal, intracerebral, and intranasal.	+ intraperitoneal.	
18	Throat washings.	Sixth	+ intranasal		
18	Lung	Autopsy	+ intraperitoneal	+ intraperitoneal.	+ intraperitoneal.

within 6 days with an extensive pneumonitis. The agent was readily transmitted in series by either intranasal or intraperitoneal inoculation of tissue suspensions into mice.

Blood taken from case 17 on the sixth day of illness was citrated and injected intraperitoneally into one guinea pig. Death of the guinea pig occurred on the twelfth day following injection. Lung tissue obtained at autopsy from case 17 was made into a 10-percent suspension in salt solution and was inoculated intraperitoneally in 0.5-cc. amounts into five mice. Death of all animals occurred in 5 to 6 days. Intranasal inoculation of the same material into five mice produced death in 7 to 10 days and intracerebral injection of this suspension into five mice produced death in 5 to 6 days. Three guinea pigs were inoculated intraperitoneally with 5-cc. portions of this suspension; two died on the seventh day and the third on the eleventh day.

A specimen of sputum preserved in 30-percent glycerin from case 17 which was sent to the National Institute of Health was given to three lots of six mice each by intranasal, intracerebral, and intraperitoneal routes, using doses of 0.03-, 0.03-, and 0.3-cc. quantities for the respective routes. None of the mice inoculated by the intranasal method became ill, although a portion of this sample of sputum to which no glycerin had been added produced death in mice inoculated intranasally at the field laboratory. Two mice given material intracerebrally were ill on the third day. These were killed, the brains removed, made into a 10-percent suspension in normal salt solution, and inoculated intraperitoneally into groups of six mice each in 0.3-cc. amounts. All mice subsequently died. On the seventh day

following inoculation, two of the mice which received glycerinated sputum intraperitoneally were ill. These were killed, and as the presence of viscous, mucoid fluid in the peritoneal cavity and flecks of fibrin suspended in this fluid was suggestive of psittacosis a search was made for elementary bodies. Elementary bodies characteristic of the lymphogranuloma-psittacosis group of virus were demonstrated in the tissues with Machiavello's stain. Animals inoculated intraperitoneally with tissues from these mice died and elementary bodies were easily demonstrated in the spleen and liver. On the eighth day following intraperitoneal inoculation with sputum, two other mice became ill, and were killed. They presented lesions similar to those noted above and elementary bodies were found in the liver and spleen.

A 10-percent suspension of human lung tissue which had been frozen in CO_2 in 0.85-percent salt solution was prepared and doses of 0.3 cc. administered to eight mice intraperitoneally. Two mice were moribund on the fifth day following infection and at autopsy presented enlargement of the spleen and a fibrinous exudate in the peritoneal cavity. Elementary bodies were noted when smears of the spleen and liver were examined. On the sixth day following injection of the human tissue one mouse was dead and two others comatose. These presented typical lesions and the liver and spleen of one of these was used to inoculate three groups of eight mice each by intraperitoneal, intracerebral, and intranasal routes, respectively. Death of all mice occurred within 3 to 4 days. Typical pneumonic lesions were produced by intranasal inoculation. Similar results were obtained from another specimen of lung tissue of the same patient and from lung tissue of case 17.

In all strains isolated from human lung tissues, tests to determine the susceptibility of mice by various routes of injection were instituted on the first mouse passage following isolation. The results are given in table 2 and show that mice are extremely susceptible to infection by the routes of injection employed.

It should be emphasized that during the months previous to this study, large numbers of animals from the colony maintained at the National Institute of Health had been subjected to close scrutiny during the course of certain studies concerning the etiology of pneumonitis and in no instance were lesions similar to those produced by the present agent observed nor were elementary bodies demonstrated in tissues stained with Machiavello's stain. No studies of viruses of any type were being carried on in the field laboratory used in New Orleans and all animals inoculated and studied with the new strain of virus were maintained in a separate isolated building. All other animals used in the study after isolation of virus had been accomplished were purchased from commercial sources in various areas or were raised at the National Institute of Health.

TABLE 2.—*The effect produced in mice by intraperitoneal, intracerebral, and intranasal inoculation of 0.3-cc, 0.03-cc, and 0.03-cc, quantities, respectively, of 10-percent tissue suspensions from mice dying during original passage of virus from human lung tissue*

Source of virus	Original isolation of virus in mice		Susceptibility of mice inoculated by various routes with tissue from previous mice			
	Date inoculated	Date moribund	Date inoculated	Days to death (by route of inoculation)		
				Intraperitoneal	Intracerebral	Intranasal
	1943	*1943*	*1943*	*Days to death*	*Days to death*	*Days to death*
Case 17	Mar. 27	Apr. 2	Apr. 2	3 to 4	3 to 4	3
Case 18	Mar. 27	Apr. 2	Apr. 2	3 to 4	3 to 4	3
Case 18	Mar. 27	Apr. 2	Apr. 2	3 to 4	3 to 4	3 to 4

EXPERIMENTAL

DISEASE PRODUCED IN MICE BY INOCULATION OF THE VIRUS

Experimental studies were made with three strains of virus. Two were isolated from case 17, one from throat washings, the other from lung tissue. The other strain originated from lung tissue of case 18.

The symptoms produced in mice did not differ to any great extent from those observed in animals suffering from infections with psittacosis or meningopneumonitis virus. When injected intraperitoneally with infective material, mice usually died in from 3 to 5 days, although some succumbed as early as the second day and others as late as the eleventh or twelfth day after administration of virus. The first symptoms were usually noted in 48 to 72 hours. The mice were listless and apathetic and the fur was ruffled. As the disease progressed a considerable amount of exudate appeared about the eyes and in many cases was sufficient to cause the lids to adhere to each other. Respirations were rapid and labored. Weakness of the hind legs was observed to such a degree as to constitute an ataxic and at times a paralyzed state. Many animals went into a deep coma and died quietly, while others developed a convulsion just prior to death.

Gross pathological lesions closely resembled those observed in infections produced by other agents in this group. During the early passages in mice a considerable number of flecks of fibrin were observed in the peritoneal cavity but in later passages these decreased and eventually disappeared. A moderate amount of a clear, viscous, stringy fluid was present in the peritoneal cavity. The exudate was tenacious and would string out when touched with an instrument. The spleen was enlarged, but displayed no discrete lesions. The serous membranes were glistening. The lymph nodes were not enlarged and the thoracic viscera were not modified except for occasional animals showing areas of pneumonitis.

Elementary bodies were readily demonstrable in the spleens and

less easily in the livers of mice dying following intraperitoneal inoculation of virus. They stained well with Machiavello's stain. The elementary bodies stain red by this method and the cells stain blue. The bodies were noted in the cytoplasm of mononuclear and polymorphonuclear cells, tissue cells, and in many instances were found outside the boundaries of cells. The number of bodies observed in any cell varied considerably, only a few being present in some instances while in others a sufficient number were present to distend the cells or were found lying free in large numbers. The bodies were also detected in smears of brain, meninges, or lungs of mice inoculated intracranially or intranasally with virus.

Titrations of virus in mice.—Titrations of the infectivity of this agent for mice when administered intracerebrally or intraperitoneally were made. Tenfold serial dilutions of tissue emulsions were made in 0.85-percent salt solution and the same suspension was used to inoculate mice by both methods.

The initial titration was made with a strain of virus which was in its second mouse passage and had been isolated from case 17. Liver and spleen from a moribund mouse were ground and suspended in 0.85-percent salt solution to make a 10-percent tissue suspension. Groups of seven mice each were given 0.03 cc. of each dilution intracerebrally under ether anesthesia and similar groups of mice were given 0.5 cc. of each dilution intraperitoneally. The mice were observed for 2 weeks. The results, given in table 3, show the ability of the virus to kill mice to the same titer when administered by either route. Similar results were obtained in other tests.

TABLE 3.—*Comparison of infectivity of virus for mice by intraperitoneal and intracerebral routes using serial tenfold dilutions of liver and spleen suspension from a mouse infected with second mouse passage virus of Louisiana pneumonitis*

Dilution of tissue suspension	Intraperitoneal inoculation		Intracerebral inoculation		Dilution of tissue suspension	Intraperitoneal inoculation		Intracerebral inoculation	
	Dose, cc.	Number of mice dying [1]	Dose, cc.	Number of mice dying [1]		Dose, cc.	Number of mice dying [1]	Dose, cc.	Number of mice dying [1]
10^{-1}	0.5	7/7	0.03	7/7	10^{-4}	0.5	7/7	0.03	7/7
10^{-2}	.5	7/7	.03	7/7	10^{-5}	.5	5/7	.03	5/7
10^{-3}	.5	7/7	.03	7/7	10^{-6}	.5	4/7	.03	2/7

[1] Numerator=number of mice dying; denominator=number of mice inoculated.

Studies were made to determine whether comparable results could be obtained by using, as a source of virus, tissues of guinea pigs dying as a result of this infection. A guinea pig which had succumbed was autopsied and the liver and lungs were made into 10-percent tissue emulsions in salt solutions. Further tenfold dilutions were then made in salt solution to a final dilution of 10^{-8}. Groups of five mice each were inoculated intracerebrally or intraperitoneally with 0.03 cc. or

0.3 cc. of each serial dilution of each tissue emulsion. The results, shown in table 4, indicate that there is little difference in the infectivity for mice of these tissue suspensions given by either of the routes of inoculation employed. It is likewise apparent that a considerable concentration of virus is present in both the liver and lungs of guinea pigs and that the concentration in this host is similar to that attained in mice.

TABLE 4.—*Results of inoculation of mice intraperitoneally or intracerebrally with serial tenfold dilutions of suspensions of liver or lung taken from a guinea pig dying from Louisiana pneumonitis virus infection*

Dilutions of tissue suspension	Liver suspension		Lung suspension		Dilutions of tissue suspension	Liver suspension		Lung suspension	
	Number of mice dying following intraperitoneal inoculation [1]	Number of mice dying following intracerebral inoculation [1]	Number of mice dying following intraperitoneal inoculation [1]	Number of mice dying following intracerebral inoculation [1]		Number of mice dying following intraperitoneal inoculation [1]	Number of mice dying following intracerebral inoculation [1]	Number of mice dying following intraperitoneal inoculation [1]	Number of mice dying following intracerebral inoculation [1]
10^{-1}	5/5	5/5	4/5	5/5	10^{-5}	5/5	5/5	3/5	2/5
10^{-2}	5/5	5/5	5/5	5/5	10^{-6}	4/5	3/5	1/5	1/5
10^{-3}	5/5	5/5	5/5	5/5	10^{-7}	3/5	2/5	0/5	0/5
10^{-4}	5/5	5/5	4/5	5/5	10^{-8}	0/5	1/5	0/5	0/5

[1] Numerator=number of mice dying; denominator=number of mice inoculated.

Reaction of mice to virus when administered by various routes.—As previously shown, mice are susceptible to virus obtained directly from humans by intraperitoneal, intracerebral, or intranasal introduction of virus, but it seemed important to determine whether or not mice were susceptible to infection when inoculated by other routes.

Strain M97 of Louisiana pneumonitis virus had been passed through 31 generations of mice before these experiments were begun and was used between the thirty-second and thirty-sixth mouse passage. Strain B had been passed through only 6 generations of mice and had been stored in a CO_2 box before inception of this study. Thus, in the study strains of virus of both recent and distant origin from a patient were employed. Inoculations were made with 10-percent mouse-spleen suspensions except for the last 2 passages with strain B when brain suspensions were used. Doses of 0.03 cc. were given intracerebrally and 0.3 cc. by the other routes (intramuscular, intraperitoneal, and subcutaneous). Groups of 8 mice were inoculated by each route. Strain M97 was given to a total of 24 mice intramuscularly and 32 mice by each of the other routes. Strain B was administered to a total of 16 mice intramuscularly and to 32 by other methods in the 4 consecutive tests given in the protocol (table 5). With the exception of 8 mice inoculated intraperitoneally and 3 which had been inoculated intracerebrally, which were killed in a moribund stage to provide material for further passage, all mice succumbed to infection. The data indicate that the mice receiving

TABLE 5.—*Results of inoculation of mice with 0.03 cc. of 10-percent mouse tissue virus (strain M97 in thirty-second to thirty-fifth mouse passage and strain B in seventh to tenth mouse passage) intracerebrally and with 0.3 cc of the same material intraperitoneally, intramuscularly, and subcutaneously* [1]

Strain of virus	Date of inoculation	Interval between inoculation and death in days			
		Intracerebral route	Intraperitoneal route	Intramuscular route	Subcutaneous route
	1945				
M97	Oct. 11	3–4	4	----------	7
	Oct. 15	3–4	3–4	5–7	4–7
	Oct. 18	3–4	3–4	4–8	4–8
	Oct. 21	2–4	2–4	4–7	4–7
B	Oct. 11	2–4	3–5	----------	5–8
	Oct. 14	2–5	4–5	----------	4–8
	Oct. 16	3–4	4–7	5–9	6–9
	Oct. 20	2–5	3–5	5–8	6–8

[1] None of the animals tested survived.

virus intracerebrally or intraperitoneally succumbed to infection in a shorter period than did those receiving virus subcutaneously or intramuscularly but that mice were susceptible to infection with this virus by any route of infection employed.

SUSCEPTIBILITY OF GUINEA PIGS TO INFECTION WITH THE VIRUS

Attempts were made to infect guinea pigs by the intraperitoneal route of injection only. These animals succumbed in from 6 to 8 days when large amounts of virus were administered, but death was delayed to 10 to 14 days if smaller amounts of virus were introduced. The mortality rate approximated 100 percent when large doses of virus were administered and progressively diminished to about 40 percent when 10^{-6} dilutions of infective mouse tissues were used as inocula. Animals given 0.25 cc. to 1.0 cc. of 10-percent suspensions of spleens from mice dying as a result of infection developed a fever 2 to 4 days following injection. A typical temperature reaction is given in figure 1. Temperatures have been recorded as high as 41.4° C. Marked weakness, loss of appetite, and progressive emaciation were noted about the fifth day after inoculation. The fur was ruffled and the animal was obviously ill. The day prior to death or on the day of death the temperature fell to normal or below, being as low as 37.8° C. in one instance. Enlargement of the spleen at autopsy was usual. A mucoid, viscous, stringy exudate covered the organs, and, in occasional animals, pulmonary consolidation involved one or all lobes of the lungs. This latter type of consolidation exhibited some of the characteristics described in the autopsies of human cases, and elementary bodies were demonstrated in smears made from such tissues.

The initial cultivation of virus in the yolk sac was successfully accomplished by Senior Bacteriologist Ida A. Bengtson. The Cox

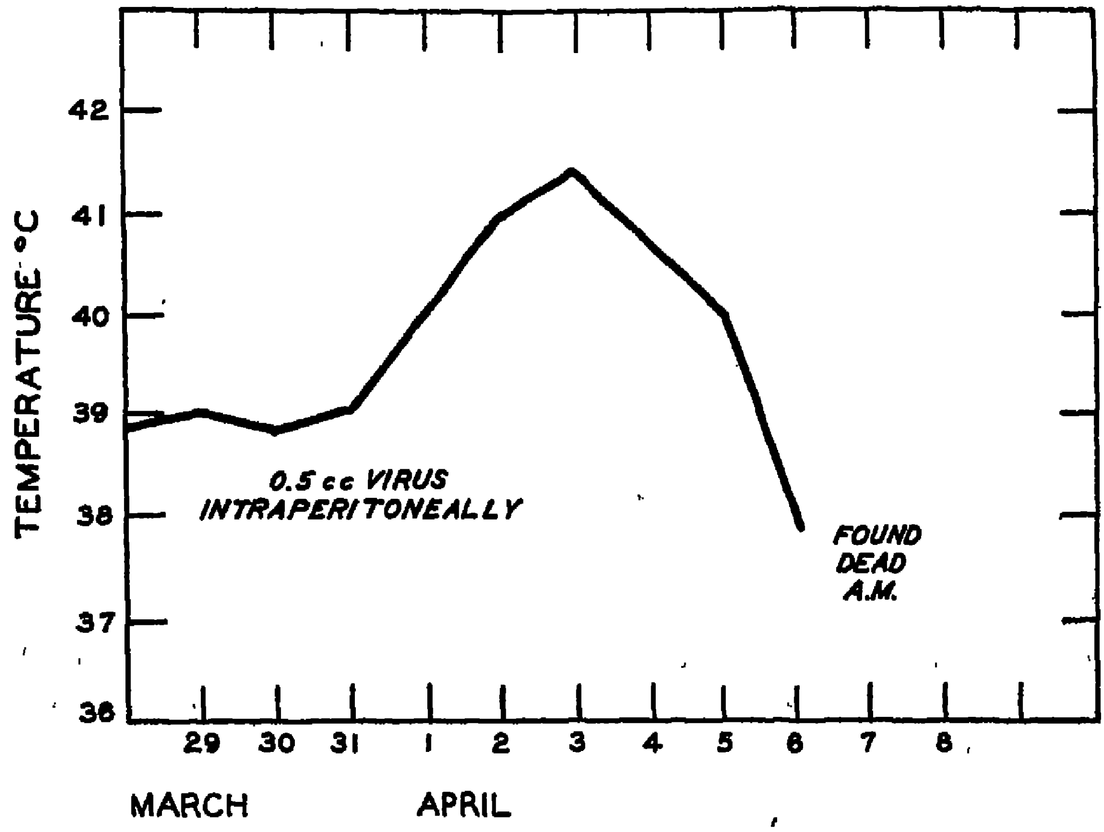

FIGURE 1.—Reaction of a guinea pig to intraperitoneal inoculation of 0.5 cc. of Louisiana pneumonitis virus.

technique was used and 0.5 cc. of 1:100 mouse-liver suspension (second passage in mice) was inoculated into the yolk sacs of 7- to 9-day-old embryos. Death of the embryo occurred in 3 to 5 days.

The virus was readily propagated thereafter through yolk-sac passage. A dose of 0.2 cc. of 1:10 or 1:100 yolk-sac virus suspension was used for inoculation of 7- to 9-day-old chick embryos. Death resulted in 3 to 5 days. The yolk sac presented no unusual changes but the embryos and chorioallantoic membranes were markedly hemorrhagic in appearance. The yolk sacs and embryos were harvested separately and frozen. Both types of material were ground in a Waring Blendor (care being taken to minimize heating) to obtain a uniform suspension. Titrations of suspensions in mice revealed a higher concentration of virus in the yolk sacs than in the embryo proper although substantial amounts of virus were present in the latter. Table 6 gives typical titrations of both types of material from the same lot of eggs when serial tenfold dilutions were given intracerebrally in doses of 0.03 cc. to mice.

Both egg-yolk membrane and chick-embryo virus were stored in a CO_2 ice box in 30-percent suspensions, and retained this potency over a period of 6 months.

FILTERABILITY OF THE VIRUS

A 1-percent suspension of spleen in salt solution was prepared from a mouse that died during the second mouse passage of virus isolated from the lung of one patient, case 17. The suspension was divided

TABLE 6.—*The infectivity of yolk-sac and embryo suspensions from eggs infected with Louisiana pneumonitis virus when administered intracerebrally in 0.03-cc. amounts*

Dilution of suspension	Embryo	Yolk sac	Dilution of suspension	Embryo	Yolk sac
	Number of mice dying [1]	Number of mice dying [1]		Number of mice dying [1]	Number of mice dying [1]
10^{-1}	8/8	8/8	10^{-5}	4/8	8/8
10^{-2}	8/8	8/8	10^{-6}	1/8	6/8
10^{-3}	8/8	8/8	10^{-7}	0/8	3/8
10^{-4}	8/8	8/8			

[1] Numerator=number of mice dying; denominator=number of mice inoculated.

into equal proportions, one of which was filtered through a Berkefeld N filter by means of negative pressure. Both the filtered and unfiltered emulsions were administered intraperitoneally to mice in doses of 0.5 cc., the former being inoculated into five mice and the latter into four mice. All animals succumbed. Those receiving unfiltered material died in 4, 4, 4, 6, and 6 days, while those receiving filtered lung suspensions died in 5, 6, 8, and 8 days, respectively.

A 1-percent suspension of liver tissue obtained from a mouse dying in the twenty-sixth mouse passage of virus isolated from case 17 was prepared. A portion was retained unfiltered for later inoculation. The remainder was divided into six approximately equal portions and filtered through new unused Mandler filters 2½ by ⅝ inches, grades 6, 7, 8, 9, 11, and 12. Filtration was effected with negative pressure. Following filtration of the infective material, each candle was immediately tested with a diluted 24-hour-old broth culture of *Serratia marcesens*. Doses of 0.03 cc. of unfiltered and filtered material were given to lots of eight mice each intracerebrally. The results are shown in table 7. The material failed to pass Mandler filters 11 and 12. Only two of eight animals receiving filtrate passing Mandler filter 9 died. Filter 8 was defective as evidenced by failure to hold back

TABLE 7.—*Showing the effect of filtering a 1 percent suspension of liver taken from mice dying during the twenty-sixth passage of virus through Mandler filters Nos. 6, 7, 8, 9, 11, and 12, and inoculating filtrates intracerebrally into groups of 8 mice each in 0.03-cc. doses*

Mandler filtrate No.	Retention of *B. prodigiosus*	Number of mice inoculated	Day of death									Ratio of deaths to mice inoculated [2]
			5th	6th	7th	8th	9th	10th	11th	12th	13th	
6	+	8	-----	-----	3	-----	1	2	-----	1	1	8/8
7	+	8	-----	-----	2	-----	2	1	-----	2	1	8/8
8 [1]	−	8	3	5	-----	-----	-----	-----	-----	-----	-----	8/8
9	+	8	-----	-----	2	-----	-----	-----	-----	-----	-----	2/8
11	+	8	-----	-----	-----	-----	-----	-----	-----	-----	-----	0/8
12	+	8	-----	-----	-----	-----	-----	-----	-----	-----	-----	0/8
Unfiltered suspension	--------	8	8	-----	-----	-----	-----	-----	-----	-----	-----	8/8

[1] Filter proved to be defective.
[2] Numerator=number of mice dying; denominator=number of mice inoculated.

B. prodigiosus. The virus passed through filter 6 and filter 7. It is apparent that the concentration of virus was diminished in the filtrate, for the time of death was prolonged among animals dying as a result of injection with filtered material as compared with animals dying as a result of injection of unfiltered material.

CENTRIFUGATION

The viruses belonging to the psittacosis-lymphogranuloma venereum group are not completely deposited by centrifugation at 3,500 to 4,000 r. p. m. for 1 hour.[8] Studies were made to determine whether or not this condition held for the virus under consideration. In one instance a pooled liver emulsion of eight mice moribund on the fifth day after injection (thirty-second mouse passage of a strain isolated from the lung of case 17) was made into a 10-percent suspension in salt solution. This was centrifuged slowly for 5 minutes to remove the larger particulate matter. A sample of this material was saved for titration and a 10-cc. sample was centrifuged for 1 hour at 3,500 to 4,000 r. p. m. in an angle centrifuge. At the end of the period the supernatant was recovered (9.5 cc.) and an equal amount of salt solution added to the "button" of precipitate. The various samples were then diluted in serial tenfold dilutions in salt solution to an end point of 10^{-7} and inoculated intracerebrally under ether anesthesia in 0.03-cc. doses into lots of eight mice each. The animals were observed for 14 days. The results are given in table 8. In this test

TABLE 8.—*Results obtained after inoculating mice intracerebrally with 0.03 cc. of tenfold dilutions of 10-percent thirty-second mouse passage virus, resuspended precipitate, and supernatant after 1 hour centrifugation*

Material	Dilution[1]	Number of mice dying[2]
Uncentrifuged sample	10^{-4}	8/8
	10^{-5}	5/8
Resuspended precipitate	10^{-4}	8/8
	10^{-5}	6/8
Supernatant after centrifugation	10^{-4}	7/8
	10^{-5}	2/8

[1] All mice receiving 0.03 cc. of dilutions 10^{-1}, 10^{-2}, and 10^{-3} of each material died and all those receiving dilutions 10^{-6} and 10^{-7} survived.
[2] Numerator=number of mice dying; denominator=number of mice inoculated.

the amount of virus present in the resuspended precipitate resulting from centrifugation was not significantly greater than that contained in the uncentrifuged sample. A considerable amount of virus was also present in the supernatant fluid resulting from centrifugation.

RESISTANCE OF VIRUS TO DELETERIOUS AGENTS

It was deemed important to define within limits the resistance of this virus to certain deleterious agents and to determine the effects of heat upon the virus.

Chick-embryo tissue refrigerated in CO_2 ice was ground in a Waring Blendor without addition of fluid. The material was tested for infectivity for mice and found to kill all mice given a 10^{-4} suspension and three of eight mice inoculated intracerebrally with doses of 0.03 cc. of a 10^{-5} dilution of tissue. Portions of the suspension were added to equal volumes of 0.025-, 0.05-, and 0.1-percent formalin solution or 0.25-, 0.5-, or 1.0-percent phenol solutions, shaken, and placed in a refrigerator (4° C.). Portions were removed at the end of 1, 2, 5, and 24 hours after exposure and tested for infectivity for mice when inoculated intracerebrally in 0.03-cc. amounts.

Undiluted suspension was placed in glass ampules, the ampules sealed, and immersed in water baths maintained at 55° C. for 1 to 2 hours or 60° C. for 1 to 3 hours before being tested for infectivity for mice. The heat lability of the virus and the relatively greater virucidal activity of formaldehyde than of phenol is readily apparent from table 9.

TABLE 9.—*The effect of various concentrations of phenol and formaldehyde and of temperatures of 55° C. and 60° C. upon virus exposed for 1, 2, 5, and 24 hours to chemical action and 1 to 3 hours to heat and subsequently inoculated in 0.03-cc. quantities intracerebrally into lots of 8 mice each*

Agent	Concentration (percent)	Ratio of number of mice dying to number of mice inoculated after exposure to agents for various intervals [1]				
		1 hour	2 hours	3 hours	5 hours	24 hours
Formaldehyde	0.05	0/8		1/8	1/8	0/8
Formaldehyde	.025	2/8		4/8	2/8	0/8
Formaldehyde	.0125	6/8		4/8	1/8	0/8
Phenol	.5	([2])		([2])	([2])	([2])
Phenol	.25	([2])		3/8	0/8	1/8
Phenol	.125	7/8		4/8	2/8	4/8
Heat (60° C.)		3/8		0/8		
Heat (55° C.)		0/8	0/8			
None	None	7/8			7/8	7/8

[1] Numerator = number of mice dying; denominator = number of mice inoculated.
[2] Death of test mice within 24 hours after inoculation with test dose.

A 10-percent suspension of liver and spleen in salt solution was prepared from an infected mouse. This was used to test the effect of 37° C. temperatures on aqueous suspensions of virus. A sample of the suspension was removed for titration before the remainder was placed in an incubator having a constant temperature of 37° C. The material was shaken frequently, and at intervals of 1, 2, 4, and 24 hours portions were removed, diluted serially in salt solution in tenfold dilutions, and inoculated intraperitoneally into groups of five mice each in doses of 0.3 cc. The results (see table 10) show that there is a noticeable decrease in virus content of suspensions maintained in salt solution at 37° C. This decrease is detectable within 4 hours after exposure to this temperature and is magnified considerably in 24 hours.

TABLE 10.—*Deaths among mice inoculated intraperitoneally with 0.3-cc. amounts of serial tenfold dilutions of unheated virus and of virus subjected to 37° temperatures for 1, 2, 4, and 24 hours*

Dilution	Number of mice dying after inoculation with unheated virus [1]	Number of mice dying after inoculation of virus exposed to 37° temperature for [1]—			
		1 hour	2 hours	4 hours	24 hours
10^{-1}	5/5	5/5	5/5	5/5	5/5
10^{-2}	5/5	5/5	5/5	5/5	5/5
10^{-3}	5/5	5/5	5/5	5/5	5/5
10^{-4}	5/5	5/5	5/5	5/5	1/5
10^{-5}	5/5	5/5	5/5	4/5	1/5
10^{-6}	5/5	5/5	5/5	2/5	0/5

[1] Numerator=number of mice dying; denominator=number of mice inoculated.

SUSCEPTIBILITY OF VARIOUS SPECIES OF ANIMALS TO INOCULATION WITH THE VIRUS

A number of species of animals other than mice and guinea pigs were tested to determine their susceptibility to intraperitoneal inoculation of infective material. These include monkeys, rabbits, white rats, cotton rats, hamsters, deer mice, ferrets, muskrats, and nutria.[2] Deaths and gross pathological lesions will be here recorded; observations regarding microscopic pathology will be reserved for a later report.

Two monkeys (*Macacus rhesus*) were injected intraperitoneally with 10-percent suspensions of tissue from case 17 which were proved infective for mice. One animal received 5 cc. of 10-percent spleen emulsion and the other 8 cc. of 10-percent lung emulsion intraperitoneally without ill effect. They were killed after being under observation for a period of 22 days. No gross lesions were noted at autopsy.

A large number of rabbits were injected intraperitoneally with yolk-sac emulsion and suspensions of mouse or guinea pig tissues. None of these animals showed the slightest reaction to administration of such material. Three rabbits were inoculated with fresh autopsy tissue from case 17, one receiving 5 cc. of 10-percent lung emulsion and two receiving 5 cc. of liver emulsion, with no resulting symptoms.

In one experiment, 9 white rats, 12 cotton rats (*Sigmodon hispidus*), and 12 hamsters (*Cricetus auratus*), 9 deer mice (*Peromyscus* sp), 2 ferrets (*Putorius foetidus*), 5 nutria (*Myocastor coypu*), and 10 muskrats (*Ondatra rivalicia*) were inoculated intraperitoneally with a 10-percent suspension of infected yolk sac. The ferrets and nutria were given 1.0 cc. of this suspension and the other animals received 0.5 cc. of the material. An additional 9 nutria and 11 muskrats were also given the virus intranasally. This virus had been previously titered and found to be capable of killing all mice receiving a 10^{-7} dilution of whole yolk sac. At the time the above animals were tested 40 guinea pigs were

[2] Acknowledgment is made to Chief Biologist James N. Gowanloch, and Special Biologist Ted O'Neil, State Department of Conservation of Louisiana, for obtaining and furnishing the muskrats used in this study, and to Mr. E. A. McIlhenny who supplied the nutria used in experimental work.

also inoculated; 20 receiving 1 cc. of 10-percent, and 20 receiving 1-percent yolk-sac virus by the same route.

Two white rats died on the fourth day and another on the fifteenth day following inoculation of virus. One animal was killed on the fourth day following injection and the remainder were killed on the twenty-first day, when the study was terminated.

Hamsters showed approximately the same degree of susceptibility as white rats. Only 4 of 12 animals died as a result of inoculation of virus: 2 succumbed on the fourth day, 1 on the sixth day, 1 on the thirteenth day following injection. Three animals were killed on the fourth day for histological examination, and 5 were alive on the twenty-eighth day when the study was terminated.

Twelve deer mice were injected with virus intraperitoneally. Four were sacrificed on the fourth day and a like number on the twenty-first day following injection of virus. One animal was found dead on the eighth day and another was moribund and was killed for further study. Elementary bodies were demonstrated in these animals.

Two ferrets, 5 nutria, and 10 muskrats receiving virus intraperitoneally showed no signs of infection and appeared normal when sacrificed 3 weeks after inoculation.

The 11 muskrats and 9 nutria inoculated intranasally likewise showed no signs of illness.

The susceptibility of guinea pigs was again well demonstrated in this study. Eight animals given 1.0 cc. of 10-percent yolk-sac suspension were killed to provide material for pathological examination on the fourth and sixth days, and 6 animals inoculated with 1.0 cc. of 1-percent yolk-sac emulsion were sacrificed on the same days for the same purpose. All of the remaining 26 guinea pigs died between the sixth and eleventh days following inoculation.

The disease produced in cotton rats was very severe. Twelve animals were inoculated with infective material and, with the exception of two killed when ill 4 days later, all died between the fourth and seventh days following infection. Cotton rats were the only animals exhibiting susceptibility to this virus comparable to that shown by white mice and guinea pigs.

The gross pathological lesions presented among animals in the above group which died as a result of exposure to infective material varied considerably. The lesions noted in guinea pigs have been previously described (page 1495). Among white rats the gross lesions closely resembled those noted among guinea pigs. The spleen was enlarged and dark, an excess of clear, sticky fluid was present in the peritoneal cavity, the liver was mottled and glistening, and the lungs showed areas of bronchopneumonia involving all lobes. Hamsters presented gross findings of fibrinous hepatitis and splenitis. The lesions observed in cotton rats were most marked. The abdominal viscera were

coated with a thick film of fibrinous plastic exudate to such a degree as to obscure the viscera from view on opening the abdominal cavity. No free fluid was present but the organs were adherent as a result of the exudate.

Birds were not used during this study since the facilities for isolating the virus were not considered adequate.

DISCUSSION

A virus fulfilling all the criteria to describe it as a member of the psittacosis-lymphogranuloma venereum group of organisms was isolated from three cases of a severe type of pneumonitis occurring in Louisiana. The agent was recovered during life from blood and sputum of patients and from lung and spleen tissue obtained at autopsy. Further, it was found capable of infecting both mice and guinea pigs on primary passage from materials taken directly from patients. Normal animals from a colony in a Louisiana laboratory and from a colony maintained at the National Institute of Health were equally susceptible to infection. In the course of previous studies and in the examinations of current stock animals no spontaneous infection remotely resembling the one in question has been encountered. The evidence thus proves that the agent isolated was that responsible for the infection in the three cases studied in this outbreak. The final proof of identity lies in the successful demonstration of elementary bodies in the passage strains isolated in experimental animals and in lung tissue of humans who succumbed to infection and from whom virus was isolated.

A number of points of difference exist between the agent and others belonging to this group. The fact that guinea pigs are susceptible to intraperitoneal inoculations of virus and present a disease syndrome including fever, emaciation, anorexia, and death serves to define the agent. The close analogy between the infective titer of virus administered to mice by intracerebral and intraperitoneal routes and the fact that mice succumb following inoculation by any route distinguishes the agent from others in the group. Results of complement fixation tests will be reported later.

SUMMARY

1. A virus has been isolated from three cases of severe pneumonitis in the bayou region of southwestern Louisiana.

2. It appears to be a new member of the psittacosis-lymphogranuloma venereum group of viruses and may be distinguished by its pathogenicity for guinea pigs and its infectivity for mice inoculated by subcutaneous or intramuscular routes.

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Through the cooperation of the Hospital Service Plan Commission of the American Hospital Association, data on hospital admissions among about 10,000,000 members of Blue Cross Hospital Service Plans are presented monthly. These plans provide prepaid hospital service. The data cover about 60 hospital service plans scattered throughout the country, mostly in large cities.

Item	October	
	1944	1945
1. Number of plans supplying data	76	78
2. Number of persons eligible for hospital care	15,384,804	18,675,618
3. Number of persons admitted for hospital care	132,891	172,968
4. Incidence per 100 persons, annual rate, during current month (daily rate × 365)	102.0	109.0
5. Incidence per 1,000 persons, annual rate for the 12 months ended Oct. 31, 1945	104.3	106.2
6. Number of plans reporting on hospital days	22	26
7. Days of hospital care per case discharged during month [1]	7.66	8.38

[1] Days include entire stay of patient in hospital whether at full pay or at a discount.

DEATHS DURING WEEK ENDED NOVEMBER 17, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 17, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	8,836	9,143
Average for 3 prior years	9,147	
Total deaths, first 46 weeks of year	411,700	412,943
Deaths under 1 year of age	595	616
Average for 3 prior years	620	
Deaths under 1 year of age, first 46 weeks of year	27,891	28,338
Data from industrial insurance companies:		
Policies in force	67,288,845	66,898,575
Number of death claims	10,767	14,054
Death claims per 1,000 policies in force, annual rate	8.3	11.0
Death claims per 1,000 policies, first 46 weeks of year, annual rate	10.0	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED NOVEMBER 24, 1945

Summary

The incidence of poliomyelitis continued to decline. A total of 174 cases was reported, as compared with 255 last week, 221 for the corresponding week last year, and a 5-year median of 158. Only 6 States reported more than 7 cases each, as follows: California 28, New York and Illinois 18 each, Wisconsin 12, Missouri 10, and Ohio 9. The total to date is 13,101, as compared with 18,712 and 11,993, respectively, in the epidemic years of 1944 and 1943, and a 5-year median of 9,379.

A total of 81 cases of meningococcus meningitis was reported (a smaller number than for any of the past 5 weeks), as compared with 141 for the corresponding week last year and a 5-year median of 93. Only 3 States reported more than 5 cases each—New York 14, Missouri 7, and California 6. The cumulative figure is 7,395, as compared with 15,126 and 16,256 for the corresponding periods of 1944 and 1943, respectively, and a 5-year median of 3,196.

For the current week, 5,240 cases of influenza were reported, as compared with 4,146 last week and a 5-year median of 1,854. Of the total (a larger number than for the corresponding week of recent years), an aggregate of 4,304, or 85 percent, occurred in 6 States, as follows (last week's figures in parentheses): Indiana 284 (109); Virginia 607 (400); South Carolina 829 (842); Texas 2,056 (1,635); Colorado 303 (113); Utah 225 (19). For the corresponding week last year these States reported an aggregate of 1,404, or about 80 percent of the total for that week. The total to date is 97,818, as compared with 354,112 for the period last year and a 5-year median of 179,196.

A total of 653 cases of diphtheria was reported as compared with 756 last week, a 5-year median of 399, and 435 for the corresponding week last year. The States reporting numbers considerably in excess of figures for the corresponding week last year are as follows (last year's figures in parentheses): Ohio 58 (11); Michigan 41 (17); Maryland 19 (4); Virginia 26 (12); North Carolina 73 (20); Tennessee 37 (15); Alabama 30 (23); and Arkansas 37 (9).

During the current week, 8,503 deaths were recorded in 92 large cities in the United States, as compared with 8,810 last week, 8,446 for the corresponding week last year, and a 3-year average of 8,580. The total to date is 418,477, as compared with 419,687 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended November 24, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944	
NEW ENGLAND												
Maine	3	2	1	4	------	------	1	2	64	0	0	0
New Hampshire	4	0	0	------	------	------	------	------	5	0	1	1
Vermont	0	0	0	------	------	------	------	3	12	0	0	0
Massachusetts	3	7	5	------	------	------	110	77	158	2	9	4
Rhode Island	0	0	0	------	28	------	1	------	2	0	2	1
Connecticut	0	1	0	------	1	1	5	15	15	1	0	1
MIDDLE ATLANTIC												
New York	13	14	14	[1] 5	[1] 1	3	99	69	257	14	28	9
New Jersey	1	4	2	3	2	4	16	9	27	2	4	4
Pennsylvania	7	10	11	2	------	------	364	82	332	5	11	6
EAST NORTH CENTRAL												
Ohio	58	11	11	7	5	12	21	17	34	4	16	2
Indiana	16	14	13	284	4	4	3	9	17	5	4	1
Illinois	3	4	17	4	1	6	204	17	85	5	8	5
Michigan [2]	41	17	12	2	------	1	177	18	62	8	7	4
Wisconsin	1	0	1	94	10	19	16	15	157	0	8	1
WEST NORTH CENTRAL												
Minnesota	8	14	1	------	------	------	4	5	10	2	4	0
Iowa	8	5	5	------	1	1	1	8	23	0	0	0
Missouri	9	10	9	4	1	3	32	2	5	7	0	1
North Dakota	1	8	6	48	------	------	3	2	2	0	0	0
South Dakota	2	0	1	------	------	------	------	2	2	0	0	0
Nebraska	0	2	5	25	------	------	1	11	11	1	0	0
Kansas	7	2	6	1	1	1	18	3	15	0	1	1
SOUTH ATLANTIC												
Delaware	0	0	0	------	------	------	------	2	2	0	2	0
Maryland [2]	19	4	6	5	6	5	5	------	16	0	1	1
District of Columbia	0	0	1	------	1	1	1	3	3	0	2	0
Virginia	26	12	24	607	139	157	63	3	48	0	1	2
West Virginia	7	2	8	150	1	18	------	5	14	1	2	1
North Carolina	73	20	27	------	2	5	12	4	8	3	1	1
South Carolina	15	4	10	829	415	331	10	8	8	1	2	1
Georgia	22	19	19	26	28	28	1	3	5	0	4	0
Florida	3	13	8	6	2	2	4	2	8	0	1	0
EAST SOUTH CENTRAL												
Kentucky	12	10	10	1	2	8	38	1	82	1	2	2
Tennessee	37	15	15	96	13	15	3	13	13	4	8	1
Alabama	30	23	21	150	18	52	1	1	9	1	2	1
Mississippi [2]	13	12	11	------	------	------	------	------	------	2	0	1
WEST SOUTH CENTRAL												
Arkansas	37	9	15	81	44	62	19	8	8	1	0	0
Louisiana	18	21	8	1	4	4	3	1	1	1	0	0
Oklahoma	11	17	11	41	64	64	4	6	8	1	0	0
Texas	78	66	43	2,056	837	807	39	26	26	5	5	4
MOUNTAIN												
Montana	1	8	8	89	1	5	4	1	13	1	0	0
Idaho	3	0	0	14	1	------	127	4	6	0	0	0
Wyoming	0	0	0	45	18	2	4	7	7	0	0	0
Colorado	6	4	6	308	9	12	7	7	26	0	1	1
New Mexico	9	5	2	3	2	2	3	------	3	0	1	0
Arizona	2	0	3	49	70	105	2	4	6	1	0	0
Utah [2]	0	0	0	225	------	3	21	7	7	0	0	0
Nevada	0	0	0	------	------	------	------	------	0	0	0	0
PACIFIC												
Washington	6	5	3	------	4	1	218	13	13	1	1	1
Oregon	9	7	2	7	9	11	8	18	25	0	0	0
California	36	34	25	28	21	36	263	188	70	6	7	7
Total	663	485	399	5,240	1,761	1,854	1,936	601	2,648	81	141	93
47 weeks	16,160	12,164	13,851	97,818	354,112	179,196	116,847	598,868	566,998	7,895	15,126	3,196

[1] New York City only.

[2] Period ended earlier than Saturday.

Telegraphic morbidity reports from State health officers for the week ended November 24, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [3]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944		Nov. 24, 1945	Nov. 25, 1944	
NEW ENGLAND												
Maine	0	3	0	24	31	17	0	0	0	1	0	0
New Hampshire	0	0	0	2	13	13	0	0	0	0	1	0
Vermont	1	1	0	15	6	7	0	0	0	0	0	0
Massachusetts	7	4	4	104	223	170	0	0	0	2	0	1
Rhode Island	0	0	0	5	5	5	0	0	0	0	1	0
Connecticut	5	3	2	21	24	25	0	0	0	0	0	2
MIDDLE ATLANTIC												
New York	18	71	11	210	223	216	0	0	0	3	2	6
New Jersey	4	3	1	26	29	63	0	0	0	0	1	1
Pennsylvania	3	14	4	176	191	187	0	0	0	1	1	7
EAST NORTH CENTRAL												
Ohio	9	10	8	280	252	237	0	0	0	2	1	3
Indiana	1	6	4	59	83	72	3	1	1	2	0	1
Illinois	18	2	5	147	174	168	0	0	2	1	4	3
Michigan [2]	6	7	7	139	173	115	1	0	1	3	1	1
Wisconsin	12	0	3	63	81	111	0	0	0	1	1	1
WEST NORTH CENTRAL												
Minnesota	3	4	4	88	59	59	0	0	0	0	0	0
Iowa	2	1	1	44	52	56	0	0	0	0	0	0
Missouri	10	2	3	42	43	58	0	0	0	4	0	0
North Dakota	0	0	0	4	12	11	0	0	0	1	0	0
South Dakota	0	0	0	7	5	24	0	0	0	1	0	0
Nebraska	3	2	2	52	50	16	0	0	0	0	0	0
Kansas	1	1	2	59	82	82	0	0	0	3	1	1
SOUTH ATLANTIC												
Delaware	2	0	0	4	1	6	0	0	0	0	0	0
Maryland [2]	1	6	1	38	66	43	0	0	0	0	1	1
District of Columbia	1	0	0	12	21	21	0	0	0	0	0	0
Virginia	1	14	2	131	50	57	0	0	0	8	3	6
West Virginia	2	3	0	87	71	65	0	0	0	1	2	1
North Carolina	1	5	3	91	98	95	0	0	0	1	0	1
South Carolina	2	2	0	8	2	10	0	0	0	0	0	1
Georgia	1	0	0	42	44	40	0	0	0	2	0	1
Florida	1	8	1	2	11	9	0	0	0	2	1	2
EAST SOUTH CENTRAL												
Kentucky	0	9	3	50	34	69	0	0	0	3	0	4
Tennessee	7	3	3	79	84	92	0	0	0	0	3	3
Alabama	1	0	0	19	18	30	0	0	0	5	1	1
Mississippi [2]	2	0	0	22	23	18	3	0	0	1	0	2
WEST SOUTH CENTRAL												
Arkansas	0	2	0	20	37	15	0	3	0	0	2	2
Louisiana	4	0	0	14	15	7	0	0	0	0	6	5
Oklahoma	1	1	1	21	31	23	0	0	0	1	0	2
Texas	4	7	7	111	93	75	0	0	0	15	8	6
MOUNTAIN												
Montana	0	1	1	7	22	24	1	0	1	3	4	0
Idaho	0	0	0	6	25	11	0	1	0	0	0	0
Wyoming	0	0	0	3	7	5	0	0	0	0	0	0
Colorado	1	1	1	24	71	31	0	0	0	1	1	1
New Mexico	0	1	0	7	15	6	0	0	0	1	1	1
Arizona	1	1	0	12	11	5	0	0	0	0	0	1
Utah [2]	1	1	1	17	18	13	0	0	0	0	0	1
Nevada	0	0	0	2	4	0	0	0	0	0	0	0
PACIFIC												
Washington	7	5	1	34	54	29	0	0	0	1	5	1
Oregon	2	10	3	20	51	25	0	0	0	0	0	0
California	28	12	12	224	239	160	0	0	0	1	2	2
Total	174	221	158	2,574	3,027	2,642	8	5	12	66	54	71
46 weeks	18,101	18,712	9,379	159,101	172,105	124,926	320	358	719	4,597	5,100	6,374

[2] Period ended earlier than Saturday.

[3] Including paratyphoid fever reported separately, as follows: Maine 1; Massachusetts 2; New York 1; Michigan 2; Texas 1.

Telegraphic morbidity reports from State health officers for the week ended November 24, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Nov. 24, 1945	Whooping cough: Week ended— Nov. 25, 1944	Whooping cough: Median 1940-44	Week ended November 24, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	15	28	28	0	0	0	0	0	0	0	0
New Hampshire			2	0	0	0	0	0	0	0	0
Vermont	28	39	31	0	0	0	0	0	0	0	0
Massachusetts	150	133	134	0	1	0	0	0	0	0	2
Rhode Island	35	1	22	0	1	0	0	0	0	0	0
Connecticut	42	70	73	0	1	0	0	0	0	0	2
MIDDLE ATLANTIC											
New York	308	202	439	3	16	0	2	0	0	3	7
New Jersey	140	64	147	3	0	1	0	0	0	0	0
Pennsylvania	206	101	228	0	2	0	0	0	1	0	1
EAST NORTH CENTRAL											
Ohio	154	114	211	0	0	0	0	0	0	0	0
Indiana	17	6	25	1	1	0	2	0	2	0	0
Illinois	143	42	132	4	11	0	0	0	3	0	6
Michigan [3]	142	69	279	1	2	0	0	0	1	0	2
Wisconsin	90	79	172	0	0	0	0	0	0	0	8
WEST NORTH CENTRAL											
Minnesota	19	48	48	2	1	0	0	0	0	0	0
Iowa	7	4	20	0	0	0	0	0	0	0	0
Missouri	3	19	19	0	0	0	0	0	0	0	0
North Dakota		12	9	0	0	0	0	0	0	0	2
South Dakota		4	4	0	0	0	0	0	0	0	2
Nebraska	8	5	8	0	0	0	0	0	0	0	0
Kansas	25	32	48	0	0	0	0	0	0	0	2
SOUTH ATLANTIC											
Delaware		3	11	0	0	0	0	0	0	0	0
Maryland [3]	38	70	70	0	0	0	0	0	0	0	0
District of Columbia	5	4	9	0	0	0	0	0	0	0	0
Virginia	37	42	51	0	0	32	0	2	2	0	0
West Virginia	30	4	17	0	0	0	0	0	0	0	0
North Carolina	64	44	102	2	1	0	0	0	0	4	0
South Carolina	55	26	31	2	19	0	0	0	0	11	0
Georgia	5	4	15	2	1	1	0	0	0	40	3
Florida		24	9	0	0	0	0	0	0	2	1
EAST SOUTH CENTRAL											
Kentucky	42	16	67	0	0	0	0	0	2	0	0
Tennessee	15	33	33	0	0	1	0	0	0	1	0
Alabama	40	21	17	2	0	0	0	0	1	9	0
Mississippi [3]				0	0	0	0	0	0	1	0
WEST SOUTH CENTRAL											
Arkansas	6	10	10	0	0	0	0	0	0	1	0
Louisiana	1		4	0	0	0	0	0	0	6	1
Oklahoma	12	8	8	2	5	1	0	0	0	0	0
Texas	78	125	102	10	207	39	0	0	1	26	11
MOUNTAIN											
Montana	2	15	16	0	0	0	1	0	0	0	0
Idaho	11	3	3	0	0	0	1	0	0	0	1
Wyoming			1	1	0	0	0	0	0	0	0
Colorado	28	81	31	0	0	0	0	0	0	0	0
New Mexico	16		4	0	1	2	0	0	0	0	0
Arizona	1	3	4	0	0	16	0	0	0	0	0
Utah [3]	6	2	14	0	0	0	0	0	0	0	0
Nevada	2		0	0	0	0	0	0	0	0	0
PACIFIC											
Washington	53	18	32	0	0	0	0	0	0	0	1
Oregon	8	2	10	0	0	1	0	0	0	0	0
California	112	92	152	2	6	0	2	0	1	2	3
Total	2,184	1,667	3,243	37	276	94	8	2	14	106	55
Same week, 1944	1,667			17	656	184	9	2	6	126	54
Average, 1942-44	2,682			31	449	64	10	[4] 1	12	[4] 63	
47 weeks: 1945	112,587			1,777	22,868	9,976	587	468	664	4,761	4,818
1944	86,588			1,685	22,341	8,815	598	458	506	4,805	3,608
Average, 1942-44	138,555		[4] 162,872	1,588	16,558	7,167	588	[4] 451	672	[4] 3,355	

[3] Period ended earlier than Saturday.
[4] 5-year median, 1940-44.

Leprosy: Louisiana 1 case.

NOTIFIABLE DISEASES, THIRD QUARTER 1945 [1]

The figures in the following table are the totals of the monthly morbidity reports received from the State health authorities for July, August, and September 1945. These reports are preliminary and the figures are therefore more or less incomplete. In most instances they include cases reported in both civilian and military populations. The comparisons made are with similar preliminary reports; but owing to population shifts and the presence of large military populations in certain States, the figures for some States are not comparable with those for prior years, especially for certain diseases. Each State health officer has been requested to include in the monthly report for his State all diseases that are required by law or regulation to be reported in the State, although some do not do so. The lists of diseases required to be reported are not the same for each State. Only 11 of the common communicable diseases are notifiable in all the States. In some instances cases are reported, in some States, of diseases that are not required by law or regulation to be reported, and the figures are included although manifestly incomplete. There are also variations among the States in the degree of completeness of reporting of cases of the reportable diseases. As compared with the deaths, incomplete case reports are obvious for such diseases as malaria, pellagra, pneumonia, and tuberculosis, while in many States other diseases, such as puerperal septicemia and Vincent's infection, are not reportable.

In spite of these known deficiencies, however, these monthly reports, which are published quarterly and annually in consolidated form, have proved of value in presenting early information regarding the reported incidence of a large group of diseases and in indicating a trend by providing a comparison with similar preliminary figures for prior years. To some extent they also give a picture of the geographic prevalence of certain diseases, as the States are arranged by geographic location.

Leaders are used in the table to indicate that no case of the disease was reported.

Consolidated monthly State morbidity reports for July, August, and September 1945

Division and State	Anthrax	Chickenpox	Conjunctivitis [2]	*Diphtheria	Dysentery, amebic	Dysentery, bacillary	Dysentery, undefined	Encephalitis, infectious	German measles	Hookworm disease	Influenza	Malaria [3]	*Measles	*Meningitis, meningococcus	Mumps	Ophthalmia neonatorum	Pellagra	Pneumonia, all forms
NEW ENGLAND																		
Maine	....	217	....	8	....	....	....	1	14	....	16	9	21	4	207	....	1	110
New Hampshire	3	28	....	....	....	....	....	....	8	....	1	4	13	5	72	....	....	10
Vermont	....	116	....	8	....	....	....	1	52	....	....	2	89	2	841	....	....	2
Massachusetts	1	574	53	33	7	108	....	1	149	2	....	307	1,156	28	1,192	88	....	[4] 262
Rhode Island	....	85	....	2	....	11	....	4	1	....	293	7	9	9	44	....	....	70
Connecticut	1	210	....	3	1	185	....	3	45	5	3	75	150	19	508	....	....	293
MIDDLE ATLANTIC																		
New York	1	1,478	....	93	45	191	....	21	....	....	[5] 17	311	451	128	[5] 780	8	....	2,253
New Jersey	1	625	....	29	8	5	19	4	128	....	15	342	249	34	826	6	....	462
Pennsylvania	3	538	....	68	3	2	....	3	....	....	11	....	1,168	78	740	3	1	420
EAST NORTH CENTRAL																		
Ohio	....	691	....	84	2	3	11	4	70	....	26	39	162	56	396	126	....	397
Indiana	....	113	2	65	14	2	17	11	21	1	47	86	80	33	141	....	....	49
Illinois	....	445	....	32	55	57	....	13	70	1	81	8	1,381	68	519	93	....	900
Michigan	....	992	6	137	23	32	1	....	163	....	7	178	774	46	604	7	....	404
Wisconsin	....	1,518	....	30	4	....	....	1	55	....	76	81	510	34	1,614	....	....	81

WEST NORTH CENTRAL																		
Minnesota		190		118	[5] 20	2	9	8			10	78	48	28				48
Iowa		88		17	5			4	11			135	112	10	201			10
Missouri		73	2	82			12	1	25		16	157	125	46	279			210
North Dakota		29		38	1			2			28		10					69
South Dakota		51	2	36								1	47	8	22			9
Nebraska		38		27				1			16		42	4	71			48
Kansas		50	1	94	2	7		12	12		5	197	118	13	344			142
SOUTH ATLANTIC																		
Delaware		1		1								18	9	1	21			3
Maryland		91	7	100	2	20	25		19		4	96	42	15	119	4		229
District of Columbia		26		1		4					1	20	5	11	45			95
Virginia		122		99	3		4,645				1,109	208	70	83	150		3	269
West Virginia		82		78	13	1					96	48	10	22	16			8
North Carolina				879	5	38						292	56	80				
South Carolina		84		204	34	624			40	340	1,252	3,741	100	6	493	9	237	475
Georgia	1	30	22	189	8	77	15			918	55	380	25	14	74		5	77
Florida		28	4	51	28	7	1	1	3	717	18	105	87	19	283	5		124
EAST SOUTH CENTRAL																		
Kentucky		65		128	4	14		1			1	204	120	24	66		3	71
Tennessee		30		182	6		71	5	9		83	58	61	45	85	3	13	260
Alabama		18		191	32			2	74		220	1,278	20	35	188		8	417
Mississippi		578		191	349	3,850				1,478	4,295	7,969	566	17	1,038	7	605	1,611
WEST SOUTH CENTRAL																		
Arkansas		87		85	54	208			22	1	119	1,175	80	23	174		5	328
Louisiana	1	9		108	81	81			16	21	305	331	70	28	54	10	3	589
Oklahoma		17		36	6	71	6	4			186	467	63	11	68	1	5	196
Texas		600		566	192	6,426	376	5			5,223	3,179	776	77	1,104	13	215	1,424
MOUNTAIN																		
Montana		172	7	13		7	1		18		41	14	185	5	169			41
Idaho		121	3	15		12	9		45		48	29	271	2	56			84
Wyoming		18		8			4				2	2	26	1	19			26
Colorado		123		44	1			2	7		115	[7] 174	87	10	160			173
New Mexico		20		41	2	60	22		2		15	11	88		84		3	189
Arizona		59	12	82			285	4	14		201	45	38	2	84	4	3	160
Utah		308		7					33		29	17	697	2	330			14
Nevada		10	3	1							5	2	21	1	10			6
PACIFIC																		
Washington		389	3	59	1	4	179	14	202		10	4	813	23	701			245
Oregon		154		43	1	1	24				14	4	220	12	158			83
California	1	2,368	5	279	41	65		212	883		98	427	3,007	166	3,574			492
Total	18	13,629	182	4,070	908	12,175	5,782	840	2,161	3,479	14,142	22,250	14,178	1,288	18,109	387	1,110	18,827
Third quarter, 1944	12	13,604	210	3,251	1,044	14,029	4,860	285	1,876	4,029	11,782	23,894	19,452	2,065	14,675	417	1,303	13,044
Median, 1940-44	18	13,304		3,101	1,024	11,715	4,360	275	3,409	4,029	11,418	27,192	24,405	660	15,677	274	1,564	18,414
Alaska		20		3			8				103		5	2	7			13
Hawaii Territory		118		6	19	62		1	47	89	6,270	[8] 42	708	6	70			[4] 25
Panama Canal Zone [9]		18		19	12	11						180	13	1	22			[10] 111

See footnotes at end of table.

Consolidated monthly State morbidity reports for July, August, and September 1945—Continued

Division and State	*Poliomyelitis	Rabies in man	Rheumatic fever	Rocky Mountain spotted fever	*Scarlet fever	Septic sore throat	*Smallpox	Tetanus	Trachoma	Trichinosis	*Tuberculosis, all forms	Tuberculosis, respiratory	Tularemia	*Typhoid and paratyphoid fever	Paratyphoid fever	Typhus fever, endemic	*Undulant fever	Vincent's infection	Whooping cough
NEW ENGLAND																			
Maine	46	-------	-------	-------	147	4	-------	1	-------	1	127	121	-------	9	-------	-------	11	4	527
New Hampshire	26	-------	-------	-------	90	14	-------	1	-------	-------	81	-------	-------	4	-------	-------	4	3	68
Vermont	36	-------	-------	-------	31	40	-------	-------	-------	-------	5	-------	-------	1	-------	-------	18	17	248
Massachusetts	326	-------	-------	-------	611	49	-------	7	1	3	750	713	-------	70	66	-------	10	-------	1, 686
Rhode Island	5	-------	28	-------	33	6	-------	-------	-------	-------	155	146	-------	4	2	-------	3	-------	153
Connecticut	133	-------	-------	1	96	117	-------	-------	-------	1	238	232	-------	12	-------	-------	27	-------	437
MIDDLE ATLANTIC																			
New York	1, 215	-------	-------	7	[11] 1, 357	-------	-------	9	-------	1	3, 310	3, 095	1	82	12	6	71	-------	4, 223
New Jersey	765	-------	-------	6	240	12	-------	3	-------	5	931	-------	-------	53	9	2	18	-------	2, 310
Pennsylvania	541	-------	444	4	750	-------	-------	3	-------	1	970	-------	1	114	-------	1	25	-------	2, 437
EAST NORTH CENTRAL																			
Ohio	276	1	12	2	844	11	1	4	2	2	1, 325	1, 284	-------	60	6	-------	15	6	2, 200
Indiana	125	1	-------	8	219	10	1	4	1	-------	605	576	-------	29	1	-------	18	46	349
Illinois	761	-------	34	10	669	34	4	16	12	-------	1, 689	1, 489	11	32	2	-------	98	23	1, 362
Michigan	126	-------	70	-------	812	58	6	6	-------	-------	1, 298	-------	-------	54	32	-------	74	-------	1, 591
Wisconsin	205	-------	-------	-------	479	14	1	-------	3	-------	559	-------	4	5	-------	-------	76	-------	845
WEST NORTH CENTRAL																			
Minnesota	130	-------	15	-------	258	90	2	3	-------	-------	[4] 368	-------	6	5	1	-------	73	16	186
Iowa	166	-------	-------	-------	168	4	1	-------	-------	-------	194	-------	-------	20	1	-------	49	35	108
Missouri	140	-------	14	4	208	7	1	-------	-------	-------	594	-------	10	32	-------	-------	16	-------	352
North Dakota	9	-------	1	-------	66	6	1	-------	-------	-------	45	43	-------	4	-------	-------	5	21	30
South Dakota	13	-------	-------	-------	34	-------	2	-------	3	-------	63	-------	-------	3	1	-------	8	2	30
Nebraska	77	-------	-------	-------	140	-------	2	-------	-------	-------	194	-------	-------	5	-------	-------	3	-------	16
Kansas	83	-------	2	3	328	10	1	4	1	6	198	185	5	15	-------	1	56	48	367

SOUTH ATLANTIC																			
Delaware	28			2	21						38	27		6			1		30
Maryland	79		21	12	238	28		3			783	752		20	3	[13] 1	1	20	684
District of Columbia	97			1	74						353	320		5	1		1		142
Virginia	258			70	361	462	1	7			911	911	15	83	5	7	15		968
West Virginia	41			5	374	1					642			43	1		1		334
North Carolina	83			43	371	49					835	812	3	40	1	43	6		1,564
South Carolina	118		136	3	103	6		1			197		8	65	11	96	11		908
Georgia	56	1	4	14	128	42		5		1	458	458	7	105	28	441	47	26	218
Florida	57				38	18		1			202	288	2	58	4	124	4	13	81
EAST SOUTH CENTRAL																			
Kentucky	31			11	242	7	2				563	558	4	96	1		4		585
Tennessee	297			9	282	29		10			874		16	186	2	16	17	26	386
Alabama	67	1		6	154		1	18			816		1	60	4	281	80		226
Mississippi	29				97		1		13		428	412	11	47		108	49		1,494
WEST SOUTH CENTRAL																			
Arkansas	82	1		3	85	111	5	2	145		313	298	45	54	3	7	18		163
Louisiana	60	1	85	1	100	197		20			724	682	8	78	8	193	16		136
Oklahoma	152			21	87	49		3	46		598		9	56	3		15	4	208
Texas	570				507	388	1		49		1,573		7	246	37	752	155		2,183
MOUNTAIN																			
Montana	47		20		52	22			2		105	50	5	21	8		2	8	61
Idaho	12		16	5	44	38	1	1			79		1	17			8	45	91
Wyoming	14			3	28	13					18		9	3	2		4		41
Colorado	104		31	4	127	56					189			23	3		11	29	575
New Mexico	10				65	3			8		[6] 806	[6] 790	1	86	3		3		88
Arizona	7		1		27	6			70		381			12	1		8	2	185
Utah	185		44	4	66	1			1		23	21	7	8	3		27		313
Nevada	11		1		4	21			2		45		3					19	18
PACIFIC																			
Washington	171		55	1	188	15		1		2	580		2	17	4		14	71	342
Oregon	34			3	103	13	2	1	1		136	130		14			16		192
California	426		177		1,447		1	25	5		3,044	2,870	4	79	12	7	65		2,700
Total	8,276	6	1,211	266	12,988	2,051	38	154	360	23	29,392	17,268	201	2,090	281	2,086	1,227	484	34,371
Third quarter, 1944	13,580	17	540	257	11,912	1,574	58	145	599	66	32,577	18,776	165	2,262	353	2,416	1,301	544	30,308
Median, 1940-44	5,794	9		208	11,559	1,209	85	145	757	66	27,201	16,281	229	2,951		1,567	1,000	486	46,158
Alaska					4						116	76	1	1				2	6
Hawaii Territory	4				72	10		8	2		177	153		3	1	27	1		
Panama Canal Zone [9]											[10] 13	[10] 13		6	6				[10] 7

See footnotes on p. 1512.

See references on pps. 1508-9-10-11

*Diseases marked with an asterisk (*) are reportable by law or regulation in all the States, including the District of Columbia. Typhoid fever is reportable in all the States; paratyphoid fever in all except 6 States. Syphilis is reportable in all the States and the District of Columbia but is not included in the table. Conjunctivitis was dropped from the list of reportable diseases in North Carolina on Jan. 1, 1945.

[1] For reports for first and second quarters of 1945, see pp. 622 and 1150 of the PUBLIC HEALTH REPORTS of June 1 and Sept. 28, 1945, respectively.
[2] Includes cases of kerato- and suppurative conjunctivitis and of pink eye.
[3] In some States practically all in the military.
[4] Lobar pneumonia only.
[5] New York City only.
[6] Includes nonresidents.
[7] Exclusive of prisoners of war.
[8] Off-shipping.
[9] Includes the cities of Colon and Panama.
[10] In the Canal Zone only.
[11] Includes septic sore throat.
[12] Tsutsugamushi fever.

The following list includes certain rare conditions, diseases of restricted geographical distribution, and those reportable in or reported by only a few States:
Actinomycosis: New Hampshire 1, Massachusetts 1, Connecticut 1, Michigan 1, Minnesota 3, Washington 1.
Botulism: New York 1, California 5.
Coccidioidomycosis: New Mexico 1, Arizona 4, California 5.
Dengue: South Carolina 8, Georgia 2, Mississippi 10, Louisiana 38, Texas 7, Hawaii Territory 1.
Dermatitis: New Hampshire 2, Missouri 234, Kansas 1.
Diarrhea: New Jersey 1, Ohio 325 (including enteritis), Indiana 3, Michigan 2, Minnesota 88 (including enteritis), Maryland 74, South Carolina 4,429, Florida 9, Colorado 1, New Mexico 66, Utah 5, Oregon 4 (including enteritis), California 19.
Dog bite: New Hampshire 1, Illinois 3,278, Michigan 2,713, Arkansas 121.
Filariasis: New Jersey 1, Indiana 1.
Food poisoning: Maine 2, Ohio 1, Indiana 1, South Carolina 38, Louisiana 5, Idaho 2, Nevada 5, Washington 71, California 80.
Granuloma (unspecified): Ohio 19.
Granuloma inguinale: Missouri 6, Florida 69, Tennessee 18, Mississippi 177, Louisiana 75, Montana 1, Arizona 2.
Impetigo contagiosa: Ohio 2, Indiana 10, Illinois 11, Michigan 200, Iowa 6, Missouri 8, North Dakota 3, Kansas 15, Maryland 27, Montana 24, Idaho 2, Nevada 32, Washington 117, Hawaii Territory 18.
Jaundice (including hepatitis and Weil's disease): Maine 4, New York 1, Indiana 32, Illinois 102, Michigan 2, Minnesota 2, Maryland 1, South Carolina 9, Florida 6, Idaho 18, Utah 3, Washington 5, Oregon 2, California 66, Hawaii Territory 56.
Leprosy: New Jersey 1, Illinois 1, Michigan 3, Minnesota 1, Louisiana 3, California 5, Hawaii Territory 3.
Lymphocytic choriomeningitis: Massachusetts 2, Minnesota 1, Maryland 6, Tennessee 10.
Lymphogranuloma venereum: Missouri 12, Florida 63, Tennessee 27, Louisiana 45, Utah 3.
Psittacosis: New York 1, Delaware 1, California 2.
Puerperal septicemia: Florida 1, Mississippi 29, Arkansas 3, Louisiana 10.
Rabies in animals: New York 116, Ohio 173, Illinois 104, Michigan 8, Iowa 15, Missouri 6, Kansas 4, Maryland 8, District of Columbia 11, South Carolina 19, Florida 2, Alabama 188, Arkansas 33, Louisiana 14, Texas 190, New Mexico 2, Utah 1, California 95.
Rat bite fever: Kansas 1, South Carolina 1, Louisiana 4.
Relapsing fever: Kansas 1, Texas 9, Nevada 14, California 3.
Ringworm: Pennsylvania 214, Ohio 4, Indiana 9, Illinois 240, Michigan 200, Minnesota 182, Missouri 4, Kansas 1, Nevada 1, Washington 45.
Scabies: Pennsylvania 14, Michigan 103, Missouri 2, South Dakota 1, Kansas 11, Maryland 28, Montana 33, Idaho 10, Nevada 20.
Silicosis: Ohio 3, Missouri 1, Kansas 1, Idaho 1, New Mexico 2, Utah 4, Washington 1.

WEEKLY REPORTS FROM CITIES

City reports for week ended November 17, 1945

This table lists the reports from 84 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	1	0	------	0	0	0	0	0	1	0	0	4
New Hampshire:												
Concord	0	0	------	0	1	0	0	0	2	0	0	0
Vermont:												
Barre	0	0	------	0	0	0	0	0	0	0	0	0
Massachusetts:												
Boston	1	0	------	0	5	2	18	14	19	0	1	29
Fall River	0	0	------	0	0	0	0	0	4	0	0	0
Springfield	0	0	------	0	1	0	1	0	3	0	0	0
Worcester	0	0	------	0	9	0	9	2	3	0	0	13
Rhode Island:												
Providence	0	0	------	0	0	0	3	0	1	0	0	18
Connecticut:												
Bridgeport	0	0	------	0	0	0	0	1	2	0	0	0
Hartford	0	0	------	0	0	1	2	0	0	0	0	5
New Haven	0	0	------	0	1	0	1	0	2	0	0	5
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	0	1	0	7	0	4	0	0	24
New York	5	0	2	1	48	6	58	1	78	0	4	80
Rochester	0	0	------	0	0	0	2	0	4	0	0	7
Syracuse	0	0	------	0	11	1	2	1	5	0	0	2
New Jersey:												
Camden	0	0	------	0	0	0	1	0	1	0	0	4
Newark	0	0	------	0	2	0	4	0	4	0	1	41
Trenton	0	0	------	0	0	0	1	0	1	0	0	0
Pennsylvania:												
Philadelphia	2	0	6	0	16	1	16	1	34	0	1	61
Pittsburgh	0	0	4	2	0	1	7	4	19	0	0	5
Reading	0	0	------	0	2	0	2	0	0	0	0	8
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	2	0	------	2	1	0	9	0	15	0	0	10
Cleveland	0	0	4	0	2	0	5	2	19	0	0	29
Columbus	6	0	------	0	0	0	2	0	8	0	0	2
Indiana:												
Fort Wayne	0	0	------	0	0	0	1	0	2	0	0	0
Indianapolis	1	0	------	0	1	0	6	0	7	0	1	3
South Bend	0	0	------	0	0	0	0	0	1	0	0	0
Terre Haute	0	0	------	0	0	0	0	0	0	0	0	0
Illinois:												
Chicago	2	0	1	1	153	4	22	3	44	0	0	59
Springfield	0	0	------	0	0	0	0	0	4	0	0	3
Michigan:												
Detroit	3	3	------	1	28	4	12	0	37	0	0	69
Flint	0	0	------	0	23	0	0	0	9	0	0	2
Grand Rapids	0	0	------	0	3	0	1	1	3	0	1	15
Wisconsin:												
Milwaukee	0	0	1	1	2	1	4	1	16	0	0	23
Racine	0	0	------	0	0	0	0	0	3	0	0	1
Superior	0	0	------	0	1	0	0	0	0	0	0	2
WEST NORTH CENTRAL												
Minnesota:												
Duluth	1	0	------	0	0	0	0	0	4	0	0	1
Minneapolis	3	0	------	0	3	0	2	1	9	0	0	5
Missouri:												
Kansas City	2	0	------	0	8	0	7	0	5	0	0	3
St. Joseph	0	0	------	0	4	0	0	0	3	0	0	0
St. Louis	0	0	7	0	2	0	9	14	8	0	0	2

See footnotes at end of table.

City reports for week ended November 17, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0		1	1	0	5	1	6	0	0	0
Kansas:												
Topeka	0	0		0	0	0	0	0	6	0	0	3
Wichita	0	0		0	0	1	8	0	6	0	0	1
SOUTH ATLANTIC:												
Delaware:												
Wilmington	0	0		0	0	0	2	0	0	0	0	1
Maryland:												
Baltimore	6	0	2	2	1	1	9	1	17	0	2	21
Cumberland	0	0		0	0	0	0	0	0	0	0	0
Frederick	0	0		0	0	0	0	0	0	0	0	0
District of Columbia:												
Washington	0	0		0	0	0	8	5	12	0	0	2
Virginia:												
Lynchburg	0	0		0	0	0	1	0	8	0	0	0
Richmond	1	0		0	1	1	8	0	9	0	0	0
Roanoke	1	0		0	0	0	0	0	3	0	0	0
West Virginia:												
Wheeling	0	0		0	0	0	0	0	14		0	0
North Carolina:												
Wilmington	0	0		0	0	0	0	0	3	0	0	1
Winston-Salem	0	0		0	0	0	0	0	3	0	0	2
South Carolina:												
Charleston	0	0	24	0	0	1	2	0	2	0	0	0
Georgia:												
Atlanta	3	0	14	0	0	0	5	0	9	0	0	3
Brunswick	0	0		0	0	0	0	0	1	0	0	0
Florida:												
Tampa	1	0		0	0	0	2	0	0	0	0	0
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	1	1	0	0	5	2	2	0	0	5
Nashville	0	0		0	0	0	2	2	3	0	0	0
Alabama:												
Birmingham	4	0	8	0	0	0	5	0	4	0	1	0
Mobile	4	0		1	0	1	0	0	1	0	0	0
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	0	0		0	0	0	0	0	1	0	0	0
Louisiana:												
New Orleans	12	0	2	2	4	3	3	3	15	0	2	1
Shreveport	1	0		0	0	0	8	1	0	0	0	0
Texas:												
Dallas	5	0		0	1	0	3	0	11	0	0	1
Galveston	0	0		0	0	0	0	0	0	0	0	0
Houston	8	0		1	0	0	4	0	5	0	0	0
San Antonio	1	0		0	1	0	5	1	1	0	0	0
MOUNTAIN												
Montana:												
Billings	0	0		0	0	0	1	0	2	0	1	0
Great Falls	0	0		0	0	0	0	0	0	0	0	0
Helena	0	0		0	0	0	0	0	1	0	0	0
Missoula	0	0		0	5	0	2	0	0	0	0	0
Idaho:												
Boise	0	0		0	0	0	0	0	1	0	0	0
Colorado:												
Denver	1	0	2	1	2	0	4	1	8	0	1	14
Pueblo	1	0		0	0	0	0	0	7	0	0	3
Utah:												
Salt Lake City	0	0		0	8	0	0	0	3	0	0	8

City reports for week ended November 17, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	0	0		0	60	0	2	5	5	0	1	12
Spokane	0	0		0	0	0	1	1	3	0	0	1
Tacoma	0	0		0	53	0	1	3	2	0	0	1
California:												
Los Angeles	3	0		3	13	1	4	10	25	0	1	3
Sacramento	0	0		0	2	0	1	0	5	0	0	3
San Francisco	0	0		0	47	0	10	3	13	0	2	6
Total	77	3	73	20	512	30	305	85	601	0	20	628
Corresponding week, 1944	102		44	20	219		371		336	0	11	495
Average, 1940–44	89		121	[1] 27	[2] 690		[1] 367		730	1	17	924

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York, 2; Chicago, 2; St. Louis, 2; Los Angeles, 1.

Dysentery, bacillary.—Cases: New York, 6; Rochester, 1; Detroit, 3; Charleston, S. C., 6; Nashville, 1; Los Angeles, 1.

Tularemia.—Cases: New Orleans, 1.

Typhus fever, endemic.—Cases: Atlanta, 3; Nashville, 4; Birmingham, 1; Mobile, 1; New Orleans, 3; Dallas, 2; Houston, 1; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 84 cities in the preceding table (estimated population, 1943, 33,798,600)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	5.2	0.0	0.0	0.0	44	7.8	88.9	44.4	97	0.0	2.6	198
Middle Atlantic	3.2	0.0	5.6	1.4	37	4.2	44.0	3.2	69	0.0	2.8	112
East North Central	8.6	1.8	3.7	3.1	131	5.5	37.9	4.3	103	0.0	1.2	133
West North Central	13.5	0.0	15.8	2.3	41	2.3	69.9	36.1	106	0.0	0.0	34
South Atlantic	21.2	0.0	70.7	3.5	4	5.3	47.7	10.6	143	0.0	3.5	53
East South Central	53.1	0.0	23.6	11.8	0	5.9	70.8	23.6	59	0.0	5.9	30
West South Central	63.1	0.0	5.7	8.6	17	8.6	51.7	14.3	95	0.0	5.7	6
Mountain	15.9	0.0	15.9	7.9	79	0.0	55.6	7.9	175	0.0	15.9	135
Pacific	4.7	0.0	0.0	4.7	261	1.6	30.0	34.8	84	0.0	6.3	41
Total	11.9	0.5	11.3	3.1	79	4.6	47.2	13.1	93	0.0	3.1	97

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 3, 1945.—During the week ended November 3, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		12	2	105	224	59	53	83	64	602
Diphtheria	2	5	5	60	3	5				80
Dysentery, bacillary				2						2
German measles				3	12		1	2	5	23
Influenza		4			6					10
Measles		3	1	140	277	2	2	19	156	600
Meningitis, meningococcus		1		1		1				3
Mumps				59	53	24	4	45	16	201
Poliomyelitis					2	1			2	5
Scarlet fever	15	15	11	92	81	15	4	20	15	268
Tuberculosis (all forms)		11	2	70	58	12		12	68	233
Typhoid and paratyphoid fever				15	1	1		1	1	19
Undulant fever				5	1					6
Venereal diseases:										
Gonorrhea		26	19	106	229	64	26	55	66	591
Syphilis		11	8	109	183	11	12	18	26	378
Whooping cough		12	4	140	11	4		12		183

Notifiable diseases—September 1945.—During the month of September 1945, cases of certain notifiable diseases were reported in Finland as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	21	Paratyphoid fever	1,953
Chickenpox	183	Pneumonia	1,058
Conjunctivitis	19	Poliomyelitis	218
Diphtheria	1,614	Puerperal fever	42
Dysentery, unspecified	67	Rheumatic fever	331
Gastroenteritis	6,488	Scabies	4,242
Gonorrhea	2,035	Scarlet fever	197
Hepatitis, epidemic	1,083	Syphilis	509
Influenza	498	Tetanus	1
Laryngitis	36	Typhoid fever	103
Malaria	31	Vincent's angina	33
Measles	32	Whooping cough	1,094
Mumps	144		

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Bolivia—Santa Cruz Department—Province of Cordillera—Lagunillas.—During the month of September 1945, 4 cases of plague were reported in Lagunillas, Province of Cordillera, Santa Cruz Department, Bolivia.

Union of South Africa—Transvaal—Pretoria.—During the week ended November 10, 1945, 1 case of plague was reported in Pretoria, Transvaal, Union of South Africa.

Smallpox

Bolivia.—For the month of October 1945, 166 cases of smallpox with 24 deaths were reported in Bolivia. The Departments reporting the highest incidence are: La Paz, 76 cases, 15 deaths; Cochabamba, 29 cases, 4 deaths; Beni, 18 cases, 1 death.

British East Africa—Tanganyika.—For the week ended October 13, 1945, 228 cases of smallpox with 33 deaths were reported in Tanganyika, British East Africa.

Peru.—For the month of September 1945, 37 cases of smallpox, including 26 cases in Lima Department, were reported in Peru.

Venezuela.—For the month of October 1945, 82 cases of smallpox with 1 death were reported in Venezuela. States reporting the highest incidence are: Federal District, 11 cases; Sucre, 36; Arágua, 22 cases, 1 death.

Typhus Fever

Bolivia.—For the month of October 1945, 43 cases of typhus fever with 20 deaths were reported in Bolivia. Departments reporting the highest incidence are: La Paz, 21 cases, 9 deaths; Potosi, 12 cases, 7 deaths; Chuquisaca, 5 cases, 1 death; Cochabamba, 4 cases, 2 deaths.

Guatemala.—For the month of September 1945, 515 cases of typhus fever with 48 deaths were reported in Guatemala.

Peru.—For the month of September 1945, 57 cases of typhus fever were reported in Peru. Departments reporting the highest incidence are: Cuzco, 24; Puno, 13; Junin, 6; Huancavelica, 6.

Yellow Fever

British Guiana—Kwakwani.—On September 24, 1945, 1 death from yellow fever occurred in Kwakwani, in the Berbice River district, British Guiana. The date of onset was September 15, 1945, in a forest 15 miles from Kwakwani.

Sudan (French)—Bamako.—On October 18, 1945, 1 case of suspected yellow fever with 1 death was reported in Bamako, French Sudan.

X

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROT, *Chief of Division*

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Public Health Reports

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1945 State Legislation on Hospital Facilities

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Public Health Reports

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LEGISLATION ON HOSPITAL SURVEYS, CONSTRUCTION, AND LICENSING CONSIDERED BY STATE LEGISLATURES IN 1945[1]

By MARY M. GUERIN, *Hospital Facilities Analyst, United States Public Health Service*

OBJECTIVE AND SCOPE OF THIS ANALYSIS

In the fall of 1944, the Council of State Governments sponsored and distributed a model State hospital survey act. This was done in recognition of the widespread public interest in adequate hospital and other health facilities, and with the conviction that after the war there would be extensive hospital and related construction, with or without Federal aid, and that this hospital construction should be scientifically planned. Such planning, with State-wide perspective, would place additional facilities where needed and supplement, rather than duplicate, existing facilities.

For those unfamiliar with the Council of State Governments, the latter is a joint governmental agency of the States maintained by appropriations from State governments. One of its functions is to submit to the States, shortly prior to their legislative sessions, suggested State legislation designed to enable the States to participate in or prepare themselves for Federal benefit programs necessitating State action. These suggested bills are presented to State officials in regional meetings held by the Council throughout the country.

The model hospital survey bill was presented, along with other suggested State legislation, before the Council's regional meetings held in December 1944. This model bill was initiated, not because surveys would be impossible without legislative authority, but rather to call attention to the desirability of doing such surveys on a State-wide basis through a State agency and to point out that sounder planning could be expected of a survey done under legislative mandate with official State sanction.

[1] From Hospital Facilities Section, States Relations Division, Bureau of State Services.

The Council's model "State hospital survey act" was brief, consisting of three sections, reprinted in appendix A.

In order to measure the influence of the Council's model hospital survey act, all legislation touching on hospitals and public health centers which had been introduced into the 1945 State legislative sessions was analyzed. As the analysis progressed, two major fields of interest emerged: (1) Legislation covering State-wide hospital surveys, as well as legislation covering both surveys and State-wide hospital and public health facility construction programs and (2) hospital licensing. These two types are covered in detail in this report.

However, as State legislation was examined, other types of interest pertaining to hospital and public health facility developments came to light. Examples are hospital and related construction legislation of more limited scope and more particularized than the construction legislation of primary interest and, also, special medical or hospital care programs. All of these impinge on hospital facility developments. These other types, therefore, are also covered briefly in this report.[2]

The history of all 1945 State bills segregated for their effect upon hospital and public health facilities has been followed. Forty-six States have been in session in 1945—that is, all of the States, except Louisiana and Mississippi. With the exception of two States (Georgia and Missouri), all of these State legislative sessions have now adjourned.[3] In the State legislatures still in session, Georgia and Missouri, there are only about three bills relating to hospital and related construction and these three are of merely incidental interest.

LEGISLATION COVERING STATE-WIDE HOSPITAL SURVEYS AND STATE-WIDE HOSPITAL AND PUBLIC HEALTH FACILITY CONSTRUCTION PROGRAMS

In this category of legislation, the language used in the bills and laws indicates two major influences: (1) The model bill of the Council of State Governments and (2) the Hill-Burton Hospital Construction Bill, S. 191, introduced in Congress on January 10, 1945. Space will not be taken here to describe this pending Federal legislation, since those interested in hospital facilities are undoubtedly familiar with it.

[2] This paper deliberately omits legislation providing for medical care or health insurance systems. While legislation of this type was considered by many legislatures this year (and, in certain individual States, a great variety of legislative proposals of this character were introduced) and although health insurance programs would, probably more than any other single development, affect the provision and use of hospital and health facilities, health insurance legislation is too broad a subject to be treated here.

Every effort has been made to effect a complete coverage of the two types of legislation of primary interest in connection with this project: (1) That providing for State-wide hospital surveys and State-wide hospital and related construction programs, and (2) that providing for hospital licensing. Because of the difficulties encountered by legislative reporting agencies and to the links in the chain whereby State legislative developments are pursued, it is recognized that there may be some omissions, although the objective in this area has been complete coverage and every step has been taken to attain the objective.

[3] This analysis was made as of Oct. 4, 1945.

Ten States have enacted legislation providing only for a State-wide survey and the programming of necessary hospital and related construction. Three other States introduced, but failed to enact such legislation. The laws enacted in the 10 States and the bills which failed to pass in the 3 States are listed as follows:

1945 State legislation covering State-wide hospital surveys (as of Oct. 4, 1945)

Enacted during the 1945 legislative session	Legislation killed during 1945 session or session closed prior to enactment
Arizona S. 2-X (ch. 19, Laws 1945).	Connecticut H. 616.
Delaware S. 195.	Nevada A. 163.
Illinois S. 336.	South Carolina S. 124.
Illinois S. 436.	South Carolina H. 555.
Indiana S. 51 (ch. 101, Laws 1945).	
New Mexico S. 268 (ch. 186, Laws 1945).	
Oklahoma H. 476.	
Rhode Island H. 713.	
Vermont H. 238 (ch. 5, Laws 1945).	
Virginia S. 27 (ch. 5, Laws 1945).	
Washington S. 233 (ch. 212, Laws 1945).	

One of the most interesting characteristics of this legislation is the similarity in the organization set up to conduct these surveys and the frequent similarity, from State to State, of the functions delegated to the State survey agency. These similarities are shown in appendix B.

Other States went beyond surveying and construction programming in their legislation and covered not only these phases, but provided also for the administration of a State-wide hospital and public health facility construction program. Nine States enacted such laws. (Only one of these nine, Oklahoma, appears among the States which enacted only survey and programming laws. That is because Oklahoma enacted two laws, one covering the survey and programming, the other, the administration of the State-wide construction program, instead of combining the two functions into one law, as other States have done.) Three other States considered, but failed to enact, legislation providing for both surveys and the administration of a State-wide construction program. In several States which enacted such laws, there were alternate bills considered which failed of passage. All of these bills, both those enacted and those which lapsed or were killed, are listed in the following tabulation:

1945 State legislation covering State-wide hospital survey and construction programs (as of Oct. 4, 1945)

Enacted during the 1945 legislative session	Legislation killed during the 1945 session or session closed prior to enactment
Alabama S. 107 (see remarks on this legislation in appendix C).	California A. 600.
Florida H. 724.	Connecticut H. 617.
Maine H. 844.	Florida S. 144.
North Carolina H. 594.	North Carolina H. 572.
Oklahoma H. 478.	Ohio S. 317.
Oregon H. 395 (ch. 285, Laws 1945).	Texas S. C. R. 16.
Texas H. C. R. 34 (see remarks on this legislation in appendix C).	Texas S. 316.
Utah S. 294.	
West Virginia H. 321.	

Here again, there is a large measure of similarity in the State organization designated to carry the program and in the functions consigned to the State agency. Here too is seen some influence of the Council's model bill, but probably a stronger influence from the Federal bill, S. 191. Along with the laws showing similarities, there are also those State laws which are strongly individual—for example, Alabama S. 107, North Carolina H. 594, and Texas H. C. R. 34. The provisions of all this State legislation providing for both surveys and the administration of a State-wide construction program, whether enacted or defunct, are given in appendix C.

In summary, of the 46 States having legislative sessions in 1945, 18 States have enacted and 5 other States have considered, but failed to enact, legislation providing for State-wide hospital surveys or the administration of State-wide hospital and public health facility construction programs or providing for both.

LEGISLATION COVERING HOSPITAL LICENSING

This report is intended to include all licensing legislation enacted or merely considered during the 1945 sessions covering any type of hospital or nursing home, except the type of legislation which undisputably gives the licensing agency authority for sanitary inspection only.

It has been found that during this year 14 States have enacted 17 licensing laws (Illinois enacted 3, Indiana 2). There is considerable variety in the types of hospitals and nursing homes covered by the licensing requirements in these 17 laws. For example, one covers all hospitals in the State except Federal hospitals; another, all hospitals except State and Federal; another, all hospitals except mental institutions; another, all public and private mental institutions; others, all private convalescent homes, etc. The great majority of these 17 laws specify the State health authority as the licensing agency.

The following summary of hospital licensing legislation shows not only for each licensing law enacted, but also for each licensing bill which was considered but not enacted, the State licensing agency and the type of institutions to be licensed.

In addition to the 14 States which enacted licensing laws, there were 5 States in which licensing legislation was considered, but failed of passage.

There were altogether 19 States which either enacted or considered some form of hospital licensing legislation during 1945.

1945 STATE LEGISLATION PROVIDING FOR HOSPITAL LICENSING (AS OF OCTOBER 4, 1945)

Enacted During 1945 Legislative Session:

Alabama S. 107.—Requires State Board of Health to license annually all hospitals established with aid under this act.

California A. 601.—Requires licensing, by the State Department of Public Health, of all types of hospitals except Federal, State, county, and city hospitals, any hospital conducted by the regents of the University of California; hospitals conducted by or for religious groups depending on spiritual means for healing; and mental institutions under the jurisdiction of the State Department of Institutions.

Delaware S. 94.—Requires a license from the State Board of Health of any sanatorium, rest home, nursing home, boarding home, and related institution for care of the "aged, infirm, chronically ill, or convalescent persons," operated by any person, partnership, association, or corporation.

Illinois H. 252.—Gives to the State Department of Public Health the function of licensing private nursing homes for physical illnesses. It specifically excludes institutions for mental illness and all hospitals.

Illinois H. 397.—Requires a license from the State Department of Public Welfare for any private mental institution and any mental unit of a private general hospital.

Illinois S. 141.—Requires a license from the State Department of Public Welfare for all private mental institutions and special mental departments in private general hospitals.

Indiana—Chap. 346, Laws 1945 (H. 390).—The State Board of Health will license all hospitals, excluding mental institutions, through a newly created council, which will have important policy and administrative functions.

Indiana—Chap. 335, Laws 1945 (S. 206).—Creates a new Indiana Council for Mental Health, with various powers, including general supervision of public psychiatric institutions and the power to license private psychiatric institutions.

Maine S. 405.—Requires a license by the State health agency for all public and private hospitals in the State, excluding State and Federal hospitals.

Maryland—Chap. 210, Laws 1945 (S. 66).—The licensing powers given to the State Board of Health by this law apply to all hospitals in the State, except Federal hospitals.

Nebraska H. 284.—Requires a license from the State health agency for any maternity hospital.

Nevada A. 62.—Requires a license from the State health agency for any maternity hospital. This licensing requirement is apparently restricted to private hospitals.

Oklahoma H. 468.—Gives to the State health agency the power to license all non-Federal hospitals in the State, except State mental hospitals.

Pennsylvania Act 68, Acts 1945 (S. 243).—Provides for licensing, by the State Department of Welfare, of mental hospitals operated by any person, copartnership, association, or corporation other than State hospitals.

South Dakota S. 62.—Requires a license from the State Board of Health for every hospital and nursing home except duly incorporated children's institutions. The regulations of the State Board of Health, however, are restricted to the sanitary and safe condition of the premises, cleanliness of operation, and the physical equipment of the institution. It has been reported that a referendum has recently been filed on this act.

Texas H. 127.—Requires a license from the State Department of Public Health for all private convalescent homes. This law defines a convalescent home as "any place or establishment where three or more pension or old age assistance recipients are housed for hire or profit," and specifically excludes hospitals.

Utah S. 26.—Requires a license from the State health agency for any maternity hospital.

Considered, but Not Enacted, During 1945 Legislative Session

Colorado H. 563.—This was essentially a public health reorganization bill. It would have given to the Division of Public Health various powers, including the power to establish and enforce minimum standards for construction and operation of hospitals and the power to license, inspect, regulate, and exercise sanitary control over hospitals and to fix minimum standards of operation and equipment for hospitals.

Illinois H. 103.—Would have required a license from the State Department of Public Health for all "private hospitals" (proprietary and voluntary nonprofit), except those in cities having at least the minimum regulatory requirements of this bill.

Illinois H. 763.—Would have required a license from the State health agency for any maternity hospital.

Illinois S. 373.—Would have required a license from the State health agency for all public and private hospitals in the State, excluding State and Federal hospitals.

Kansas H. 267 and *Kansas S. 248.*—Would have required a license from the State Board of Health for all public and private hospitals and nursing homes in the State, except Federal hospitals.

Massachusetts H. 2029.—Would require a license from the State Department of Public Health for all hospitals, sanatoria, and convalescent or nursing homes operated "for charity or profit," excluding the following: (1) Mental institutions licensed by or under the general supervision of the Department of Mental Health, (2) institutions caring exclusively for the aged not requiring medical or nursing care and licensed by the Department of Public Welfare, and (3) any nursing or convalescent home conducted in accordance with Christian Scientist principles. This bill, although not enacted, is not dead, but is being held over for consideration at the next annual session.

Michigan H. 182.—Would have given to the State health agency

the power to license all non-Federal hospitals in the State, except State mental hospitals.

Michigan S. 118.—Would have required a license from the State health agency for any maternity hospital.

Michigan S. 335.—Would have required a license from the State health agency for all public and private hospitals in the State, excluding State and Federal hospitals.

North Dakota H. 90.—This bill, requiring a license from the State Department of Health, would have applied to all hospitals, both public and private, in the State, except Federal hospitals. In addition to the licensing provisions, it would have authorized the State Health Department to accept any Federal, county, or other funds and any supplies or equipment available to the State for hospital facilities, goods, and services.

OTHER LEGISLATION

Special State commissions to study medical and hospital care problems.—State legislation this year has reflected a tendency to set up special commissions to study medical care or hospital problems in the State. (The commissions referred to here have been given responsibilities differing from those of a State agency assigned a State-wide hospital survey to determine construction needs.) Such laws were enacted this year in Hawaii, Illinois, New York, Virginia, and West Virginia. Ohio considered, but did not enact, such legislation.

Through the enactment of Senate Joint Resolution 10, Hawaii created a Territorial Hospital Service Study Commission to study "hospital and burial services and costs in the Territory" and make recommendations to the next legislature.

The two new commissions in Illinois, the one created by Illinois Senate bill 336 to study the hospitalization and medical care needs of the State, the other, the Commission on the Care of Chronically Ill Persons, set up by Illinois Senate bill 436, to study the adequacy of hospitalization and other treatment facilities for the chronically ill, have been treated in appendix B. They are mentioned here again, because their assignments are somewhat different from those of the usual State hospital facility survey agency.

In New York, under Act 66, approved in January 1945, the temporary State commission previously established to study medical care and to make recommendations to the legislature will be continued through February 15, 1946. Under New York Act 1916 (ch. 255, Laws 1945), the temporary State commission established in 1938 to formulate a long-range State health program will be continued to March 31, 1946. Chapter 255 also provides for cooperation between these two temporary State commissions.

Virginia, in adopting Senate Joint Resolution 8-XX, has established a new commission to study the facilities now offered by the State for hospitalizing indigents, to determine whether more efficient service could be rendered by making funds for hospital care of indigents available to the political subdivisions, and to make recommendations to the governor and assembly.

West Virginia House Concurrent Resolution 4, adopted February 15, 1945, creates an interim committee to study a number of matters of medical, hospital, and public health interest, including the "availability of hospital facilities in all areas of the State, compared with the need therefor," and to report to the legislature by January 10, 1947.

The Ohio bill (S. 19) which died in the legislature would have created a new commission to study the causes and effect of tuberculosis and collect data on the tuberculosis hospitals of Ohio and other leading States so as to recommend the means of bringing the Ohio tuberculosis hospitals into conformity with the best standards in other leading States.

Miscellaneous hospital and related construction legislation.—The legislation referred to here is not as broad in coverage as that reviewed under the topic "Legislation Covering State-wide Hospital Surveys and State-wide Hospital and Public Health Facility Construction Programs."

Georgia has enacted a resolution and has two bills still pending which touch in a very general way on hospital and public health facilities. Under House resolution 113, approved March 8, 1945, the legislature resolved, among other things, that the State Department of Health and the State Board of Health should "cooperate with all health agencies, hospitals, medical centers, maternity homes, nursing homes, and other such institutions in the advancement of health work in Georgia;" that they should give special attention to the possibility of constructing additional tuberculosis hospitals and to tuberculosis control and treatment; and should cooperate with private hospitals and agencies engaged in health improvement. House bills 155 and 156, still pending, would authorize the State Board of Health to build and operate, or to assist political subdivisions in the building and maintenance of, hospitals and other health facilities. The circumstances under which this aid would be given are unspecified.

There was an interesting bill (S. 68) introduced in North Carolina but not enacted which would authorize the State Board of Health to contribute, on an equalization basis, to the construction of necessary public or voluntary nonprofit hospitals and health centers. The State contribution would have varied, up to a maximum of 50 percent of construction costs, in accordance with the economic ability of the area served or of the nonprofit hospital sponsor and the availability of funds from other sources.

North Dakota and Wisconsin have enacted laws establishing different types of State medical centers and there are still pending in Congress two bills (S. 223 and S. 879) providing for a "hospital center" in the District of Columbia.

Under the North Dakota law, Senate bill 115, a North Dakota State Medical Center is to be established at the University of North Dakota for the coordination of health and welfare activities of the State, its political subdivisions, and private doctors. The center will be operated by the university and its medical school under the supervision of the State Board of Higher Education, with advisory assistance from the Medical Center Advisory Council, to be established under this law. This Council is directed to formulate plans for implementing, through the State Medical Center, a unified program for the improvement of the health of the people of the State. Such a plan would include: Ways and means of training an adequate number of doctors, nurses, sanitary engineers, public health administrators, and other personnel; the establishment and maintenance of facilities for hospitalization and care of indigent and such other patients as should be treated for full use of the State Medical Center; and plans for full use of the center by private doctors and public health and welfare administrators. The law permits admission of pay patients if this is found necessary for clinical experience in the medical school.

The Wisconsin Diagnostic Center, to be set up under chapter 501, Laws 1945 (S. 110), will be administered by the State Department of Public Welfare and staffed by professionally qualified persons from the teaching staff of the University Medical School. This center is to provide complete physical and mental diagnostic service to all persons committed to the care of the State Department of Public Welfare, except those patients committed to the State insane hospitals at Mendota and Winnebago. For coordination between the Department of Public Welfare and the University Medical School, the law creates an "administrative committee," composed of the president of the university, the chairman of the State Board of Public Welfare, the dean of the University Medical School, and the director of the Department of Public Welfare.

There were several bills introduced in the New Mexico legislature proposing the establishment and operation of State-owned general hospitals. The bill which was enacted, Senate bill 35 (ch. 56, Laws 1945), provides for the establishment of a State General Hospital, to be managed and controlled by a State General Hospital Board, which is to be appointed by the Governor with the advice and consent of the Senate. This hospital is intended for the care of the indigent sick who are residents of New Mexico. Persons able to pay and nonresidents of the State are to be admitted under regulations to be adopted by the State General Hospital Board.

Several States this year have included in their appropriations to the State health agency moneys for the construction of public health facilities. Illinois has appropriated over two million dollars for construction of a new State public health building in Springfield (Ill. S. 417). Pennsylvania has appropriated funds for construction of a State health laboratory (ch. 82A, Laws 1945).

State legislation has demonstrated a considerable interest in the construction of tuberculosis hospitals. Five States this year enacted laws providing for programs or funds or both for the construction of State or other public tuberculosis hospitals: Alabama (Governor's Act 287, Acts of 1945); Florida (H. 373); Illinois (S. 417); Tennessee (ch. 54, Public Acts 1945); and Washington (ch. 220, Laws 1945). The Tennessee and Washington laws set up special State commissions to see that such construction is carried out.

There was introduced in the Ohio legislature a bill (S. 3) to create a "public institutional building commission" for the purpose of constructing buildings for the hospitalization and care of the feeble-minded, insane, psychopathic, and epileptic. Senate bill 3, however, died in the legislature.

There have been several bills providing for the construction of State chronic hospitals. Chapter 421, Laws of Maryland, 1945, authorizes the State Board of Health to establish three institutions in different sections of the State for needy chronic patients. There are to be two sections in each institution: a chronic hospital and an infirmary. Massachusetts has had several such bills under consideration: House bill 150, which died this session, provided for the construction by the State Department of Public Health of a cancer hospital of not more than 200 beds in conjunction with a chronic disease hospital of not more than 600 beds. Massachusetts House bill 1304, which provided for construction by the State Department of Public Welfare of a new chronic hospital and infirmary to replace the existing one at Tewksbury, was superseded by other legislation to be held over for the next legislative session.

No attempt has been made to trace all of the State legislation authorizing no State action, but empowering political subdivisions to take steps to provide hospital and related facilities. However, several bills of this character are of sufficient interest to mention. These are not referred to as all-inclusive of their kind, but rather as interesting individual pieces of legislation. The following are in that category: Kansas Senate bill 92; chapter 416, Laws of Minnesota 1945; chapter 289, Laws of Indiana 1945; and Missouri House bill 280. All have been enacted, except Missouri House bill 280, which is still pending.

Kansas Senate bill 92 and chapter 416 of the Laws of Minnesota 1945 both authorize certain types of cities to contribute to nonprofit hospital organizations part of the cost of erecting a needed hospital.

Chapter 289, Laws of Indiana 1945, permits counties and cities to accept gifts for the purpose of erecting suitable buildings for the county and city health departments.

Missouri House bill 280 would authorize any county or group of counties to levy taxes and to establish an organization for the building, maintenance, and operation of "public county health centers" for the health improvement of all inhabitants of such counties. The unusual feature of this bill is the type of organization to which the building and operation of the center would be entrusted—"a bona fide organization of at least 250 resident members, paying annual dues each of at least one dollar, be a corporate body, constitution and bylaws legally adopted and its officers legally elected and qualified, and when so formed, shall be the legal and official body in the county or counties for the promotion of health activities in said county or counties. It shall cooperate with the Missouri State Board of Health or its successors and shall be empowered to enter into contracts and agreements with State and federal health authorities for the furtherance of all health activities." The director of the public health center is to be appointed by the county court or courts.

Special medical or hospital care programs.—Maryland is now initiating a program of medical care for indigent and medically indigent persons. This program, created by chapter 91, Laws 1945, is to be administered by the State Board of Health. Under this law, the newly created Bureau of Medical Services within the State Board of Health may make contracts with physicians, dentists, and hospitals for the care of eligible individuals.

Several States have enacted legislation providing for mental health programs.

Chapter 971, Laws of California 1945, permits the State Department of Public Health to maintain a mental health service to assist local departments of health and education in the establishment of mental health services, and requires the Public Health Department to coordinate this service with the program of the State Department of Mental Hygiene.

Public Act 288, Acts of Connecticut 1945, requires each State mental hospital to establish psychiatric clinics for adults and empowers the State Department of Health to make grants for establishment of psychiatric services to general hospitals whose plans for such services are approved by that department.

Public Act 271, Acts of Michigan 1945, creates a new State Department of Mental Health which is to have three divisions: Business administration, hospitals, and mental hygiene. The powers and duties of the State Hospital Commission are transferred by this law to the new Department of Mental Health.

West Virginia House bill 12, approved March 15, 1945, not only gives the State Health Department advisory medical supervision over State mental hospitals and emergency hospitals as well as over State tuberculosis hospitals, but also provides for stimulus of the tuberculosis control program and initiation of a mental health program. To effect the last provision, the Commissioner of Health is authorized to establish a Bureau of Mental Hygiene, conduct mental hygiene clinics, utilize the professional services of the State mental hospitals, cooperate with school authorities in making the services of psychologists and psychiatrists available to schools, conduct educational programs, and take other action approved by the Public Health Council.

Florida considered, but did not enact, a bill requiring the State Board of Health to formulate a plan for the care and treatment of indigent persons suffering from cancer and to establish standard requirements for the organization, equipment, and conduct of "cancer units or departments in general or private hospitals or private clinics." This bill was House bill 154.

Alabama, California, and Washington enacted, and Idaho considered, but defeated, legislation providing for the establishment of local public hospital districts. Under California chapter 932, Laws 1945, and Washington chapter 264, Laws 1945, the public hospital districts are to own and operate public hospitals. The provisions of Idaho House bill 129 were similar. Under Alabama Senate bill 107, the district or regional hospital association may cooperate with, or act as agent for, the State Board of Health for the purpose of constructing and operating a public hospital.

SUMMARY

The experience this year with State legislation demonstrates an extensive public consciousness of the importance of adequate hospital and related facilities. It illustrates the value of concentrating State interest in a new function by bringing before State officials, and through the mechanism of their own national organization—the Council of State Governments—a suggested or model bill aimed at a specific purpose, but adaptable to various State needs. It shows a desire to ascertain, on an objective and scientific basis, hospital and related facility needs, and also manifests a widespread desire to establish and maintain professional standards for hospital operation through State licensing. After study of the various legislative measures enacted into law this year, there is no doubt of the trend to extend and enrich hospital and related health services provided by both public and voluntary agencies.

APPENDIX A

(Suggested Bill of the Council of State Governments)

THE STATE HOSPITAL SURVEY ACT

(Title: It should conform to State requirements. The following is a suggestion; a more complete title should be used where necessary: "An Act to provide for the making of a survey of all hospital and health center facilities in the State.")

(*Be it enacted*, etc.)

SEC. 1. *Hospital survey.*—The State (Health) Department shall (a) make a survey of the location, size, and character of all existing public and private (proprietary as well as nonprofit) hospitals and health centers in the State;

(b) Evaluate the sufficiency of such hospitals and health centers to supply the necessary physical facilities for furnishing adequate hospital, clinic, and similar services to all the people of the State; and

(c) Compile such data and conclusions, together with a statement of the additional facilities necessary, in conjunction with existing structures, to supply such services.

The (Health) Department shall utilize, so far as practicable, any appropriate reports, surveys, and plans prepared by other State agencies.

(SEC. 2. *Acceptance of Federal grants.*[1]—The (Health) Department is authorized to apply for and to accept on behalf of the State, to deposit with the State (Treasurer), and to expend for the purposes for which granted or advanced, any grant or advance made by the United States or by any agency or officer thereof to assist in meeting the cost of carrying out the purposes of sec. 1.)

SEC. 3. This act shall take effect immediately (include emergency statement where necessary).

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[1] This section need not be used where authority to accept grants, etc., already exists.

Consideration might also be given to the legislative policy of some States coupling authorization to accept grants and advances from outside sources "with the consent of the Governor."

APPENDIX B

Provisions of 1945 State Legislation Covering State-wide Hospital Surveys (as of Oct. 4, 1945)

1. ENACTED LEGISLATION

Legislation	Agency administratively responsible for survey	Advisory Council	Extent of administrative agency's authority	Remarks
Arizona S. 2-X (ch. 19, Laws 1945).	State Health Department	A committee of 6 members, to be appointed by the Governor—1 representative of each of the following: Hospitals, medicine, nursing, agriculture, labor, business.	Substantially same as under Delaware S. 195.	Somewhat similar to the model of the Council of State Governments. (The foregoing is a summary of the bill as introduced. Copies of the law are not yet available.)
Delaware S. 195	State Board of Health	None	Required to survey all hospitals and health centers in State and to compile conclusions as to additional hospital and health center facilities needed, in conjunction with existing facilities, to serve all the people of the State. Authorized to apply for and receive Federal funds for survey and planning purposes.	Very similar to model of Council of State Governments.
Illinois S. 336	A new commission of 9 members set up under this act: 3 Senate members, 3 House members, and 3 to be appointed by Governor.	None	Required to study hospitalization and medical care needs of State and report to next Assembly.	State-wide hospital facility survey will probably be based *not* on this law, but on an executive designation.
Illinois S. 436	A new Commission on the Care of Chronically Ill Persons—9 members: 3 Senate members, 3 House members, Director of Public Welfare, Director of Public Health, and Director of Illinois Public Aid Commission.	None	Required to study adequacy of hospitalization and other treatment facilities for chronically ill and to report to next Assembly.	
Indiana S. 51 (ch. 101, Laws 1945).	State Board of Health	None	Same as under Delaware S. 195	Similar to model of Council of State Governments.
New Mexico S. 263 (ch. 136, Law 1945).	State Public Health Department	12 members to be appointed by Governor and to include representatives of nongovernment groups, and of State agencies, concerned with the operation, construction, or utilization of hospitals.	Required to carry on all hospital surveys and planning programs and to report on same to Surgeon General, U. S. Public Health Service.	Similar to survey segment of Federal bill, S. 191.

Oklahoma H. 476	State Commissioner of Health	6 members: Chairman, State Board of Public Affairs; Dean, Oklahoma School of Medicine, University of Oklahoma; and 1 named by each of the following 4 organizations: State Medical Assn., State Osteopathic Assn., State Hospital Assn., State Nurses' Assn.	Directed to survey need for hospital and health center facilities, develop programs for their construction; to carry out standards of the Surgeon General, U. S. Public Health Service, for developing such programs; and to make reports required by Surgeon General. Authorized to apply for and accept Federal funds for survey and program planning.	Similar in some respects to S. 191. Note that after a survey of all existing hospitals and health centers in State, their sufficiency to serve "all the *indigent* people of the State" is to be evaluated and additional facilities planned accordingly. Note, however, that Oklahoma H. 478, the 1945 hospital construction bill (see appendix C) provides for a State-wide hospital construction program to serve "all the people of the State."
Rhode Island H. 713	State Department of Health	None	Same as under Delaware S. 195	Very similar to model of the Council of State Governments.
Vermont H. 238 (ch. 5, Laws 1945).	A new commission of 5 members to be appointed by Governor under this act.	None	Substantially same as under Delaware S. 195.	Similar in some respects to model of the Council of State Governments.
Virginia S. 27 (ch. 5, Laws 1945).	State Department of Health	None	Same as under Delaware S. 195	Very similar to model of the Council of State Governments.
Washington S. 233 (ch. 212, Laws 1945).	State Department of Health	A council of representatives of non-government groups, and of State agencies, concerned with the operation, construction, and use of hospitals—to be appointed by State Director of Health.	Substantially same as under Delaware S. 195.	Shows influence of both the model of the Council of State Governments and of the Federal bill, S. 191.

2. LEGISLATION INTRODUCED, BUT KILLED OR LAPSED WITH END OF 1945 SESSION

Connecticut H. 616	State Department of Health	None	Same as under Delaware S. 195	Very similar to model of the Council of State Governments.
Nevada A. 163	State Board of Health	A council of not more than 20 members, to be appointed by the State Board of Health and to include State officials and private citizens interested in the operation, construction, or utilization of hospitals.	Substantially same as under Delaware S. 195. State Board of Health also authorized to cooperate with the Surgeon General of the U. S. Public Health Service in the making of the survey.	Somewhat similar to model of the Council of State Governments. Also some similarity to survey segment of S. 191. After passing both Houses, Nevada A. 163 was vetoed.
South Carolina S. 124 (a) as introduced.	State Board of Health	A council to be appointed by State Board of Health, and to include 3 medical representatives; 3 hospital management representatives; an unspecified number of representatives of the nursing, dental, pharmaceutical, labor, agricultural, and industrial interests; and also the Dean of the Medical College of South Carolina.	Substantially same as under Delaware S. 195.	Somewhat similar to model of the Council of State Governments.

APPENDIX B—Continued

Provisions of 1945 State Legislation Covering State-wide Hospital Surveys (as of Oct. 4, 1945)—Continued

2. LEGISLATION INTRODUCED, BUT KILLED OR LAPSED WITH END OF 1945 SESSION—continued

Legislation	Agency administratively responsible for survey	Advisory Council	Extent of administrative agency's authority	Remarks
South Carolina S. 124 (b) as amended.	A new South Carolina Hospital Commission of 15 members appointed by the governor, with representation as follows: 4 hospitals; 3 medicine; 1 public welfare; 1 agriculture; 1 organized labor; 1 business; 1 education; 1 dentistry; 1 optometry; and 1 nursing.	None.	Required to survey all hospitals and health centers in State, compile conclusions as to additional hospital and health center facilities needed, in conjunction with existing facilities, to serve all the people of the State; to determine State aid necessary to supplement local funds to construct needed hospitals and health centers; to study all plans operating in State for hospital care of indigent; to recommend to next Assembly, through the Governor, on legislative action needed to effectuate an adequate State-wide hospital program; to receive Federal funds and services from Federal Government, The National Hospital Association and its affiliates.	Note points of similarity to North Carolina H. 594, summarized in appendix C.
South Carolina H. 555.	A new South Carolina Hospital Commission of 15 members appointed by Governor. Representation same as on Commission proposed in South Carolina S. 124 as amended, except that under H. 555 there would be 2 representatives of public health, none of optometry, and 3 instead of 4 representatives of hospitals.	None.	Same as under South Carolina S. 124 as amended.	H. 555 is very similar to South Carolina S. 124 as amended, and both of these South Carolina bills show marked resemblances to North Carolina H. 594. (See appendix C.)

APPENDIX C

Provisions of 1945 State Legislation Covering State-wide Hospital Survey and Construction Programs (as of Oct. 4, 1945)

1. ENACTED LEGISLATION

Legislation	Agency administratively responsible for State program	Advisory Council	Extent of administrative agency's authority	Remarks
Alabama S. 107	State Board of Health	Council of 13: 3 hospital administrators to be appointed by State Hospital Association or by Governor, if the association fails to appoint; 1 member of State Board of Censors, to be appointed by that Board; 4 members of the lay public, to be appointed by the Governor; State Health Officer; State Director of Public Welfare; Director of State Planning Board; Director of Finance; and Attorney General. State Health Officer to be chairman.	Authorized to acquire, construct, maintain, and operate public hospitals, health centers, and related facilities; to administer Federal, State, and other funds for this purpose; to contract with any political subdivision or nonprofit association, for same purpose. Required to set up a master hospital plan, dividing State into regions, districts, and zones. Authorized to establish regulations providing standards for construction and operation of hospitals established under this act and providing for their annual licensing.	No specific provision is made for nonprofit voluntary hospitals to benefit from construction funds, either State or Federal. Although establishment of a master hospital plan for the State is required of the State agency, this act does not mention a survey of existing facilities; it does, on the other hand, provide for purely local determination of hospital needs (which seems to be contrary to a State-established master plan). Alabama S. 107 appears to depend upon the constitutional amendment proposed in S. 106, filed with the Secretary of State July 9, 1945, which, if voted favorably at the next general elections, will empower the State to acquire, own, and operate hospitals, health centers, and other health facilities, appropriate funds therefor, and to authorize political subdivisions to appropriate funds for such purposes.
Florida H. 724	Authorizes the Governor to designate the agency.	Authorizes the Governor to appoint a council "to conform with the terms of Federal legislation."	With specific reference to Federal legislation designed to assist States to survey the need for hospital facilities, which in conjunction with existing facilities, will be sufficient to serve all the people of the State, to develop construction programs, and to construct public and other nonprofit hospitals in accord with such programs. H. 724 authorizes the Governor to provide for carrying out such purposes in accordance with standards of the Surgeon General.	Shows influence of the Federal bill, S. 191.

Provisions of 1945 State Legislation Covering State-wide Hospital Survey and Construction Programs (as of Oct. 4, 1945)—Continued

I. ENACTED LEGISLATION—continued

Legislation	Agency administratively responsible for State programs	Advisory Council	Extent of administrative agency's authority	Remarks
Maine H. 844	State Department of Health and Welfare.	None	Required to survey the need for additional hospital and health center facilities, which, together with existing facilities, will be sufficient to serve all the people of the State. Authorized to accept the provisions of any present or future Federal law making funds available for public health services of all kinds, including hospital and health center construction, and to meet requirements in connection with such funds.	Similar to, but goes further than, the model hospital survey bill of the Council of State Governments.
North Carolina H. 594	The newly created North Carolina Medical Care Commission of 20 members, of whom 18 appointed by Governor and 2 ex-officio. Last 2 without vote. Of the 20, 8 representatives of the State Medical Society; 1 of the State Hospital Association; 1 of the State Dental Association; 1 of the State Nurses' Association; 1 of the State Pharmaceutical Association; 1 of Duke Foundation; 10 of agriculture, labor, industry, and other interests, and, ex-officio, Commissioner of Public Welfare and Secretary State Board of Health.	5-member council, to be appointed by Governor and to include representatives of nongovernment groups, and of State agencies, concerned with the operation, construction, or utilization of hospitals and allied facilities.	Authorized to administer State fund aid for hospitalization of indigent; to survey needs for hospital and health center facilities and the need for State aid to furnish them, and to make recommendations and report on these needs to the next Assembly; to set up and administer any State-wide plan for construction and maintenance of hospitals and health centers; to administer loans to medical students; and to expand the Medical School of the University of North Carolina.	
Oklahoma H. 478	State Commissioner of Health	H. 478 provides for no council, but refers to the State Advisory Council, presumably the one set up in Oklahoma H. 476. (See Appendix B.)	Directed to formulate, and submit to the Surgeon General of the U. S. Public Health Service for approval, a State plan setting forth a hospital and health center construction program sufficient, in conjunction with existing facilities, to serve all the people of the State. Authorized to carry out approved State plan; to make reports required by the Surgeon General. Required to review the State plan from time to time and submit necessary modifications to Surgeon General and Federal Advisory Council. Authorized to accept Federal funds for construction and for	Shows influence of the Federal bill, S. 191.

			administrative expenses and to comply with regulations relating to their expenditure.	
Oregon H. 395 (ch. 285, Laws 1945).	State Board of Health	Council of 8 members, to appointed by Governor and to represent nongovernmental groups and State agencies, concerned with the operation, construction, or utilization of hospitals. Chairman of Council: Secretary of State Board of Health.	Required to survey existing hospital and health center facilities in State and those necessary to serve all the people of the State; to formulate a State program providing for construction and maintenance and operation in order of relative need and when funds are available for such purposes; and to provide such methods of administering the State program as required by the Surgeon General. Authorized to process construction applications; to apply for and receive Federal funds for carrying out purposes of this act. With respect to any application for construction, authority of State Board of Health shall cease on completion of that construction.	Shows influence of S. 191.
Texas H. C. R. 34	A new Hospital Survey Commission of 15 members, to be appointed by the Governor; 2 members from each of the 4 sections of the State, East, West, North, and South, with the remaining 7 from the State at large. Further, 6 members to be actively engaged in hospital work, 2 to be representatives of the press, 2 to be Senate members, 2 to be House members, 1 an architect, 1 an attorney, and 1 the President of the Texas County Judges Association.	None	Authorized to survey existing hospitals and the need for additional hospitals and health centers, to recommend improvement of inadequate conditions, to execute the hospital program in conjunction with any and all Federal agencies, and to distribute Federal grants-in-aid in accordance with survey data and regulations.	A very confused bill. Although "said commission is hereby authorized and requested to make a comprehensive survey," it is also resolved in this measure "that the State Department of Public Health of Texas be designated as the agency to make necessary surveys." H. C. R. 34 was ruled invalid by the State's Attorney General within a month after its approval on June 6, 1945. On September 18, 1945, the Governor designated the State Board of Health "to carry out the purposes" of S. 191, with the aid of an advisory council named by the Governor at the same time.
Utah S. 234	State Department of Health	None	Authorized to receive Federal funds which may be made available for surveying, planning, constructing, and operating hospitals, public health centers, and related facilities, and for other health purposes.	This law is very brief, providing little other than what is given in the foregoing column.
West Virginia H. 321	State Department of Health	Authority conferred by this act on State Department of Health may be exercised only with joint approval of Commissioner of Health and the existing Public Health Council. (Also authorizes the Governor to appoint such an advisory council as may be necessary under Federal law.)	Authorized to cooperate with the Federal Government in a hospital construction program; to inventory existing hospitals and public health centers, to adopt and supervise the administration of such a State-wide plan for the construction of additional hospitals and public health centers as may be necessary under Federal law making Federal aid available for such purposes.	

Provisions of 1945 State Legilsation Covering State-wide Hospital Survey and Construction Programs (as of Oct. 4, 1945)—Continued

2. LEGISLATION INTRODUCED, BUT KILLED OR LAPSED WITH END OF 1945 SESSION

Legislation	Agency administratively responsible for State programs	Advisory Council	Extent of administrative agency's authority	Remarks
California A. 600 (as amended in Assembly May 28, 1945).	State Department of Public Health.	Council of 7 to be appointed by the Governor. Members to be outstanding in fields pertaining to hospital and health activities. A majority to be authorities on hospital operation. Chairman of Council: State Director of Public Health.	Required to survey need and adopt programs for construction of such hospitals and health centers as will, in conjunction with existing facilities, serve all the people of the State; to adopt and effectuate a State-wide construction plan meeting standards of the Surgeon General, U. S. Public Health Service, and from time to time make necessary plan revisions. Authorized to apply for, receive, and provide for expenditure of Federal funds in accordance with Federal law, provided that construction of any facility for use by any State agency shall be performed by State Department of Public Health through the Department of Public Works and in accordance with State Contract Act. Authorized to make reports required by Surgeon General.	Language very similar to that of the Federal bill, S. 191.
Connecticut H. 617 (House substitute bill of Apr. 12, 1945).	State Department of Health	None	Required to survey all existing hospitals and health centers in State and develop programs for construction of such additional facilities as necessary, in conjunction with existing facilities, to serve all the people of the State; and to supervise construction in accordance with such programs. Authorized to apply for and receive Federal funds for such purposes. Also authorized to study present basis of State appropriations to private and quasi-public hospitals.	Similar, in some respects, to model of the Council of State Governments.
Florida S. 144	State Board of Health	5 members appointed by Governor, with representation as follows: 1, hospitals; 1, medicine; 1, tuberculosis control; 1, engineering; and 1, public health.	Required to survey existing hospitals and related facilities and compile conclusions as to additional facilities necessary, in conjunction with existing facilities, to supply the needs of the people. Authorized to cooperate with Federal agencies, political subdivisions, associations, and individuals in carrying out intent of any contribution in supplying facilities found necessary; and to apply for and accept Federal funds.	This bill as introduced shows some similarities to model of the Council of State Governments, as well as some influence of the Federal bill, S. 191. S. 144 was reported by substitute in the Senate, May 14, 1945, but the substitute bill, which died in the Senate, is not available.

North Carolina H. 572	State Board of Health	Authorizes Governor to set up a council, to include representatives of nongovernment groups, and of State agencies concerned with the operation, construction, or utilization of hospitals and allied facilities.	Authorized to set up and administer any State-wide plan for construction and operation of hospitals and related facilities. With approval of State Advisory Council, authorized to promulgate such State-wide plans. Authorized to receive and administer Federal funds for construction which may become available.	Shows influence of the Federal bill, S. 191.
Ohio S. 317	State Department of Health	Not more than 8 members to be appointed by Governor and to include representatives of nongovernment groups, and of State agencies, concerned with the operation, construction, or utilization of hospitals. Chairman: State Director of Health.	Authorized to carry out the purposes of the Public Health Service Act of July 1, 1944, as amended by the Hospital Construction Act (S. 191), and to make such reports as required by the Surgeon General.	Shows influence of the Federal bill, S. 191.
Texas S. C. R. 16	State Department of Health	None	Authorized to survey existing hospital facilities and the need for additional hospitals, clinics, and health centers; to recommend improvement of inadequate conditions; to execute the hospital program in conjunction with Federal agencies; and to accept and distribute Federal grants in accordance with regulations approved by the Conference of State and Territorial Health Officers.	Shows influence of the Federal bill, S. 191.
Texas S. 216	State Department of Health	Authorizes State Board of Health to appoint a State Advisory Council in accord with S. 191, or any similar enacted legislation, or requirement by any Federal agency.	Authorized to survey existing hospitals and health centers; as provided for in S. 191 or similar enacted Federal legislation, and to determine need for additional hospital and health center facilities; to make and/or approve applications and plans for Federal funds, as provided for in aforesaid legislation.	Specifically mentions provisions of the Federal bill, S. 191.

DEATHS DURING WEEK ENDED NOVEMBER 24, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Nov. 24, 1945	Corresponding week, 1944
Data for 92 large cities of the United States:		
Total deaths	8,503	8,446
Average for 3 prior years	8,580	
Total deaths, first 47 weeks of year	418,477	419,687
Deaths under 1 year of age	500	565
Average for 3 prior years	597	
Deaths under 1 year of age, first 47 weeks of year	28,300	29,001
Data from industrial insurance companies:		
Policies in force	67,290,418	66,911,354
Number of death claims	10,053	11,202
Death claims per 1,000 policies in force, annual rate	7.8	8.8
Death claims per 1,000 policies, first 47 weeks of year, annual rate	10.0	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 1, 1945

Summary

A total of 13,220 cases of influenza was reported, as compared with 5,240 last week and a 5-year (1940–44) median of 2,478. The largest number reported for a corresponding week in the past 10 years was 4,489, in 1943. The sharp rise was due to increases in several widely scattered States. Eleven States reporting an aggregate of 12,320 cases, or 93 percent of the total and 95 percent of the increase are as follows (last week's figures in parentheses): Indiana 1,253 (284), North Dakota 647 (48), Kansas 782 (1), Virginia 1,438 (607), West Virginia 1,276 (150), South Carolina 1,117 (820), Texas 4,436 (2,056), Alabama 346 (150), Colorado 447 (303), Arizona 195 (49), Utah 383 (225). The first 7 of the above listed States reported 10,949 cases, or about 83 percent of the total and 50 percent of the increase. The total of cases reported to date for the country as a whole is 111,040, as compared with 356,312 for the same period last year and a 5-year median of 182,210.

A total of 173 cases of poliomyelitis was reported, as compared with 174 last week and a 5-year median of 130. Slight increases occurred in a few States. The largest numbers were reported in California (31), New York (21), Wisconsin (12), Missouri (11), and Illinois and Texas (10 each). The total to date is 13,275, as compared with 18,888 and 12,134 for the same periods of 1944 and 1943, respectively, and a 5-year median of 9,509.

A total of 105 cases of meningococcus meningitis was reported, as compared with 81 last week, 172 and 274 for the corresponding weeks of 1944 and 1943, respectively, and a 5-year median of 88. The largest numbers were reported in Pennsylvania (15), Illinois (14), New York (7), and Texas (6). The cumulative total is 7,500, as compared with 15,298 last year, 16,530 in 1943, and a 5-year median of 3,284 for the same period.

The incidence of diphtheria continued the seasonal downward trend of the past 4 weeks. A total of 581 cases was reported, as compared with 653 last week and a 5-year median of 439. The cumulative total, however, is above that for any prior year since 1939—16,744 cases, as compared with 12,603 for the same period last year and a 5-year median of 14,312.

A total of 9,462 deaths was recorded for the week in 93 large cities of the United States, as compared with 8,537 last week, 9,406 for the corresponding week last year, and a 3-year (1942–44) average of 9,728. The cumulative total is 429,699, as compared with 430,826 for the same period last year.

Telegraphic morbidity reports from State health officers for the week ended Dec. 1, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Dec. 1, 1945	Dec. 2 1944		Dec. 1, 1945	Dec. 2, 1944		Dec. 1, 1945	Dec. 2, 1944		Dec. 1, 1945	Dec. 2, 1944	
NEW ENGLAND												
Maine	12	0	0	1	------	------	1	14	125	0	1	1
New Hampshire	3	0	0	------	------	------	21	12	11	0	1	0
Vermont	0	0	0	------	------	------	2	------	------	1	0	0
Massachusetts	8	9	4	------	------	------	113	75	226	8	9	5
Rhode Island	0	0	1	------	27	1	------	------	1	1	1	1
Connecticut	5	0	0	------	1	3	4	11	11	1	6	2
MIDDLE ATLANTIC												
New York	10	12	12	[1] 4	[1] 1	[1] 4	114	83	263	7	21	15
New Jersey	5	10	5	41	1	14	13	18	31	5	9	5
Pennsylvania	8	18	12	------	2	2	528	35	289	15	11	7
EAST NORTH CENTRAL												
Ohio	37	12	17	51	7	9	19	16	25	4	8	3
Indiana	12	16	16	1,253	16	16	5	11	21	2	2	1
Illinois	8	6	24	10	8	8	208	28	31	14	20	3
Michigan [2]	21	14	12	14	1	1	155	8	63	4	6	2
Wisconsin	4	0	0	32	11	17	20	20	128	4	2	1
WEST NORTH CENTRAL												
Minnesota	16	9	9	3	1	1	5	2	53	4	0	0
Iowa	5	1	2	------	------	------	1	10	21	3	0	0
Missouri	5	3	4	13	2	2	27	1	9	0	7	3
North Dakota	3	24	2	647	20	16	------	1	1	0	0	0
South Dakota	1	0	3	14	------	------	2	7	7	1	0	0
Nebraska	0	2	4	112	5	5	4	4	4	0	0	0
Kansas	5	1	7	782	4	5	28	7	17	2	1	1
SOUTH ATLANTIC												
Delaware	2	0	0	13	------	------	1	2	3	0	0	0
Maryland [2]	16	9	7	26	1	5	1	2	8	0	4	4
District of Columbia	1	0	0	2	------	1	2	1	4	3	2	1
Virginia	27	9	23	1,438	133	184	44	6	20	0	2	2
West Virginia	5	4	7	1,276	71	13	1	5	5	0	1	1
North Carolina	55	33	33	------	------	1	24	8	25	1	5	1
South Carolina	20	5	9	1,117	297	322	29	1	12	0	2	1
Georgia	11	9	10	81	12	24	9	------	7	0	1	1
Florida	10	11	5	------	------	2	6	2	2	1	3	2
EAST SOUTH CENTRAL												
Kentucky	13	4	10	14	2	3	121	3	37	1	4	3
Tennessee	19	13	11	131	26	29	7	21	21	5	8	1
Alabama	12	18	18	346	56	58	5	3	31	2	5	2
Mississippi [2]	35	6	8	------	------	------	------	------	------	4	2	1
WEST SOUTH CENTRAL												
Arkansas	30	17	14	61	75	75	11	3	9	0	0	0
Louisiana	14	20	10	14	30	16	3	4	2	1	3	1
Oklahoma	10	15	17	54	67	67	6	4	3	1	1	1
Texas	68	58	50	4,436	1,138	1,088	45	33	33	6	6	3
MOUNTAIN												
Montana	2	6	2	80	18	8	2	2	15	0	1	0
Idaho	1	0	0	24	1	1	91	1	8	0	0	0
Wyoming	0	0	0	52	10	4	2	2	2	0	0	0
Colorado	9	2	6	447	20	33	8	9	60	2	1	1
New Mexico [3]	6	3	2	4	------	2	1	------	4	0	1	1
Arizona	3	1	4	195	83	143	2	4	11	0	2	0
Utah [2]	0	0	0	388	20	3	29	8	8	0	1	0
Nevada	0	0	0	------	------	------	------	------	------	0	0	0
PACIFIC												
Washington	6	18	2	------	------	------	367	38	38	1	4	2
Oregon	2	2	3	15	9	23	20	22	58	1	0	1
California	41	44	29	34	24	51	345	363	101	5	13	4
Total	581	439	439	13,220	2,200	2,478	2,452	910	3,717	105	172	88
48 weeks [3]	16,744	12,603	14,312	111,040	356,312	182,210	118,302	599,278	572,427	7,500	15,998	3,284

[1] New York City only. [2] Period ended earlier than Saturday.
[3] Delayed report for New Mexico for the week ended Nov. 17, 1945: Diphtheria 3, dysentery, unspecified, 5, influenza 2, measles 3, poliomyelitis 1 scarlet fever 28, whooping cough 1.

Telegraphic morbidity reports from State health officers for the week ended Dec. 1, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever[4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Dec. 1, 1945	Dec. 2, 1944		Dec. 1, 1945	Oct. 2, 1944		Dec. 1, 1945	Dec. 2, 1944		Dec. 1, 1945	Dec. 2, 1944	
NEW ENGLAND												
Maine	2	0	0	37	31	13	0	0	0	1	1	1
New Hampshire	1	0	0	1	15	8	0	0	0	0	0	0
Vermont	2	0	0	6	17	2	0	0	0	0	0	0
Massachusetts	9	5	1	124	218	208	0	0	0	4	4	1
Rhode Island	0	0	0	10	13	6	0	0	0	1	0	0
Connecticut	2	1	1	24	50	39	0	0	0	2	1	0
MIDDLE ATLANTIC												
New York	21	66	11	251	290	230	0	0	0	4	6	10
New Jersey	1	10	8	64	104	101	0	0	0	0	2	1
Pennsylvania	4	9	4	170	287	196	0	0	0	2	6	6
EAST NORTH CENTRAL												
Ohio	2	6	5	251	301	240	0	0	0	0	1	3
Indiana	3	0	1	67	93	93	2	0	0	1	0	1
Illinois	10	4	6	149	215	215	1	0	1	0	1	2
Michigan[2]	3	7	5	140	146	146	0	0	0	3	3	2
Wisconsin	12	2	2	83	118	135	0	0	1	2	0	0
WEST NORTH CENTRAL												
Minnesota	3	1	1	46	72	72	0	0	0	0	0	0
Iowa	4	4	1	36	48	48	0	0	0	0	0	0
Missouri	11	3	3	58	55	54	0	0	1	0	1	3
North Dakota	0	2	0	5	20	11	0	0	0	0	0	0
South Dakota	1	0	0	8	9	29	0	0	0	0	0	0
Nebraska	1	3	3	47	32	27	0	0	0	0	0	0
Kansas	1	1	2	64	78	76	0	0	1	1	0	1
SOUTH ATLANTIC												
Delaware	0	0	0	7	10	14	0	0	0	0	0	0
Maryland[2]	1	2	0	51	66	51	0	0	0	0	1	3
District of Columbia	5	2	1	7	18	19	0	0	0	2	0	0
Virginia	0	4	4	135	56	56	0	0	0	5	2	3
West Virginia	1	1	1	85	91	72	0	0	0	2	3	1
North Carolina	2	4	1	89	90	108	0	0	0	1	2	1
South Carolina	1	1	0	18	10	11	0	0	0	0	1	0
Georgia	1	1	1	22	27	29	0	1	0	2	0	3
Florida	4	0	0	7	12	7	0	0	0	3	1	1
EAST SOUTH CENTRAL												
Kentucky	0	4	3	62	49	62	0	0	0	0	1	1
Tennessee	5	1	1	39	53	58	0	0	0	3	3	3
Alabama	0	1	1	35	30	30	0	0	0	1	0	1
Mississippi[2]	1	2	2	22	8	14	0	0	0	0	2	3
WEST SOUTH CENTRAL												
Arkansas	1	2	0	10	31	18	0	0	2	1	1	3
Louisiana	4	0	1	14	14	15	0	1	0	3	4	4
Oklahoma	0	0	0	18	28	22	0	0	0	2	1	4
Texas	10	7	0	136	82	54	0	0	0	8	6	6
MOUNTAIN												
Montana	3	1	0	16	20	20	2	0	0	0	1	1
Idaho	0	0	0	46	19	19	1	0	0	0	0	0
Wyoming	0	0	0	5	0	5	0	0	0	1	0	0
Colorado	3	0	0	35	76	25	0	0	0	6	4	3
New Mexico[3]	0	0	0	9	18	11	0	0	0	1	0	2
Arizona	0	0	1	4	15	6	0	0	0	1	0	0
Utah[2]	2	1	1	30	13	20	0	0	0	1	0	1
Nevada	0	1	0	0	0	0	0	0	0	0	10	0
PACIFIC												
Washington	3	6	3	36	44	39	0	0	0	2	0	1
Oregon	2	2	1	24	17	17	0	0	0	1	1	1
California	31	9	9	283	317	153	0	0	0	4	5	3
Total	178	176	180	2,831	3,462	2,903	6	2	13	71	75	78
48 weeks[3]	13,275	18,888	9,509	161,998*	175,567	128,170	326	360	787	4,668	5,175	6,452

[2] Period ended earlier than Saturday.
[3] Delayed report for New Mexico for the week ended Nov. 17, 1945: poliomyelitis 1, scarlet fever 28.
[4] Including paratyphoid fever reported separately, as follows: Massachusetts 2; Rhode Island 1; Connecticut 2; Michigan 1; Virginia 1; North Carolina 1; Georgia 2; Florida 1; Tennessee 1; Texas 2.
*Cumulative total changed in accordance with corrected reports.

Telegraphic morbidity reports from State health officers for the week ended Dec. 1, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended—Dec. 1, 1945	Whooping cough: Week ended—Dec. 2, 1944	Whooping cough: Median 1940–44	Week ended Dec. 1, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	67	80	24	0	0	0	0	0	0	0	0
New Hampshire	15	4	4	0	0	0	0	0	0	0	0
Vermont	72	29	34	0	0	0	0	0	0	0	2
Massachusetts	165	114	207	0	1	0	1	0	0	0	2
Rhode Island	31	19	19	0	2	0	0	0	0	0	0
Connecticut	65	76	76	0	6	0	0	0	0	0	1
MIDDLE ATLANTIC											
New York	301	259	436	4	15	0	3	0	0	0	12
New Jersey	273	94	187	0	0	2	0	0	1	0	2
Pennsylvania	239	153	183	0	0	0	0	0	0	0	1
EAST NORTH CENTRAL											
Ohio	153	96	159	0	0	0	0	0	0	0	0
Indiana	18	17	19	1	1	0	0	0	0	0	1
Illinois	126	62	195	7	17	0	1	0	7	0	9
Michigan [2]	141	62	250	0	2	0	0	0	0	0	7
Wisconsin	48	92	117	0	0	0	0	0	0	0	4
WEST NORTH CENTRAL											
Minnesota	15	31	69	1	0	0	0	0	0	0	4
Iowa	10	5	21	0	0	0	0	0	0	0	0
Missouri	6	17	17	0	0	1	0	0	3	0	1
North Dakota	4	10	10	0	0	0	1	0	0	0	1
South Dakota	6	-------	2	0	0	0	0	0	0	0	0
Nebraska	10	2	6	0	0	0	0	0	0	0	0
Kansas	22	32	32	0	0	0	0	0	0	0	3
SOUTH ATLANTIC											
Delaware	2	-------	3	0	0	0	0	0	0	0	0
Maryland [2]	33	55	55	0	0	0	0	0	0	0	1
District of Columbia	4	4	10	0	0	0	0	0	0	0	0
Virginia	23	64	64	0	0	21	0	0	0	1	0
West Virginia	8	19	19	0	0	0	0	0	0	0	0
North Carolina	90	80	136	1	4	0	0	0	0	2	0
South Carolina	65	42	28	2	19	0	0	0	1	4	0
Georgia	24	13	16	0	1	1	0	0	1	31	1
Florida	5	5	9	0	0	0	0	0	0	6	1
EAST SOUTH CENTRAL											
Kentucky	39	5	57	0	0	1	0	0	13	0	0
Tennessee	30	7	42	0	0	1	1	0	1	4	0
Alabama	38	31	13	0	0	0	0	0	1	16	2
Mississippi [2]	-------	-------	-------	0	0	0	0	0	0	4	3
WEST SOUTH CENTRAL											
Arkansas	8	28	20	0	0	0	0	0	1	1	0
Louisiana	1	-------	4	0	0	0	0	0	0	4	0
Oklahoma	10	1	5	2	2	0	0	0	0	0	0
Texas	115	174	156	7	372	61	0	0	0	22	25
MOUNTAIN											
Montana	1	19	15	0	0	0	0	0	0	0	1
Idaho	65	3	5	0	0	0	0	0	0	0	0
Wyoming	-------	13	4	0	0	0	0	0	0	0	0
Colorado	31	15	17	0	1	0	0	0	0	0	0
New Mexico [3]	12	-------	16	0	6	4	0	0	0	0	0
Arizona	9	11	11	0	0	35	0	0	0	0	0
Utah [2]	8	18	18	0	0	0	0	0	0	0	2
Nevada	-------	-------	-------	0	0	0	0	0	0	0	0
PACIFIC											
Washington	30	14	48	0	0	0	0	0	0	0	0
Oregon	8	13	15	0	0	0	0	0	0	0	0
California	120	134	182	3	8	0	3	0	1	2	2
Total	2,566	2,022	3,525	28	457	127	10	0	30	97	88
Same week, 1944	2,022	-------	-------	36	517	190	9	0	33	80	67
Average, 1942–44	2,674	-------	-------	27	401	124	10	[5] 0	21	[5] 78	-------
48 weeks: 1945 [3]	116,104	-------	-------	1,806	23,325	10,108	597	464	694	4,858	4,601
1944	88,610	-------	-------	1,721	22,858	8,505	607	453	542	4,885	3,557
Average, 1942–44	141,229	-------	[5] 165,897	1,610	16,959	7,317	598	[5] 451	694	[5] 3,419	-------

[2] Period ended earlier than Saturday.
[3] Delayed report for New Mexico for the week ended Nov. 17, 1945: dysentery, unspecified, 5, whooping cough 1.
[5] 5-year median, 1940–44.

WEEKLY REPORTS FROM CITIES

City reports for week ended Nov. 24, 1945

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
Maine:												
Portland	2	0	------	0	-------	0	1	0	3	0	0	11
New Hampshire:												
Concord	0	0	------	0	-------	0	0	0	3	0	0	------
Massachusetts:												
Boston	3	0	------	0	1	1	10	6	26	0	1	17
Fall River	0	0	------	0	-------	0	0	0	7	0	0	2
Springfield	0	0	------	0	1	0	1	0	6	0	0	------
Worcester	0	0	------	0	9	0	10	0	11	0	0	7
Rhode Island:												
Providence	0	0	------	0	1	0	1	0	3	0	0	28
Connecticut:												
Bridgeport	0	0	------	0	-------	0	0	1	3	0	0	3
Hartford	0	0	1	0	-------	0	1	0	0	0	0	6
New Haven	0	0	------	0	-------	0	6	0	0	0	0	3
MIDDLE ATLANTIC												
New York:												
Buffalo	1	0	------	1	-------	0	2	0	15	0	0	11
New York	11	1	5	0	44	7	56	2	64	0	0	45
Rochester	0	0	------	0	3	0	0	2	5	0	1	17
Syracuse	0	0	------	1	24	0	5	0	12	0	0	4
New Jersey:												
Camden	0	0	------	0	1	0	2	0	3	0	0	1
Newark	0	0	------	0	3	0	2	0	6	0	0	22
Trenton	0	0	------	0	-------	0	1	0	0	0	0	7
Pennsylvania:												
Philadelphia	1	0	2	1	22	0	17	0	35	0	0	40
Pittsburgh	2	0	2	2	1	1	7	1	5	0	0	3
Reading	0	0	------	0	-------	0	1	0	0	0	0	16
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	3	0	------	0	-------	0	8	0	21	0	0	9
Cleveland	0	0	17	1	4	1	8	2	22	0	0	41
Columbus	6	0	------	0	1	0	4	0	10	0	0	------
Indiana:												
Fort Wayne	0	0	------	0	-------	0	1	0	0	0	0	------
Indianapolis	5	0	------	0	2	0	7	3	10	0	0	6
South Bend	0	0	------	0	1	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	-------	0	0	0	0	0	1	------
Illinois:												
Chicago	0	0	2	0	147	2	25	1	46	0	0	64
Springfield	0	0	------	0	1	0	0	0	2	0	0	10
Michigan:												
Detroit	6	0	3	1	19	1	8	1	33	0	0	74
Flint	0	0	------	0	27	0	2	0	6	0	0	------
Grand Rapids	1	0	------	0	2	0	0	0	4	0	0	3
Wisconsin:												
Milwaukee	0	0	------	0	-------	0	0	3	14	0	0	17
Racine	0	0	------	0	-------	0	0	0	3	0	0	------
Superior	0	0	------	0	-------	0	0	0	0	0	0	------
WEST NORTH CENTRAL												
Minnesota:												
Duluth	0	0	------	0	-------	0	2	1	2	0	0	------
Minneapolis	2	0	------	0	2	0	4	0	17	0	0	8
St. Paul	0	0	------	0	1	1	4	0	3	0	0	6
Missouri:												
Kansas City	2	0	------	1	5	0	5	0	9	0	0	------
St. Joseph	0	0	------	0	24	0	0	0	2	0	0	------
St. Louis	1	0	4	0	1	3	5	10	13	0	1	2

City reports for week ended Nov. 24, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
WEST NORTH CENTRAL—continued												
North Dakota:												
Fargo	0	0		0		0	0	1	0	0	0	
Nebraska:												
Omaha	0	0		0	2	0	3	0	11	0	0	4
Kansas:												
Topeka	0	0		0		0	3	0	4	0	0	1
Wichita	0	0	1	1		0	4	0	10	0	0	2
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0		0		0	1	0	0	0	0	
Maryland:												
Baltimore	18	0	2	1	1	0	6	0	9	0	0	20
Cumberland	0	0	4	0		0	1	0	0	0	0	
Frederick	0	0		0		0	0	0	0	0	0	
District of Columbia:												
Washington	0	0		0	1	0	8	1	12	0	0	5
Virginia:												
Lynchburg	1	0		0		0	1	0	4	0	0	3
Richmond	1	0		0		0	3	0	6	0	0	
Roanoke	0	0		0		0	0	0	1	0	0	
West Virginia:												
Wheeling	0	0		0		0	1	0	1	0	0	
North Carolina:												
Raleigh	0	0		0		0	2	0	1	0	0	
Wilmington	0	0		0		0	0	0	4	0	0	1
Winston-Salem	2	0		0		0	1	0	6	0	0	10
South Carolina:												
Charleston	0	0	18	0		0	1	1	1	0	0	
Georgia:												
Atlanta	1	0	16	1	1	0	2	0	2	0	0	
Brunswick	0	0		0		0	1	0	2	0	0	
Savannah	0	0		0		0	1	0	0	0	0	
Florida:												
Tampa	1	0		0		0	2	0	0	0	1	
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	1	0	5	1	1	1	12	2	4	0	0	4
Nashville	1	0		1		1	3	1	1	0	0	2
Alabama:												
Birmingham	1	0	4	0		0	2	0	3	0	0	1
Mobile	2	0		1		0	1	0	2	0	0	
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0		0		0	2	0	1	0	0	
Louisiana:												
New Orleans	3	0	1	1	2	1	6	0	4	0	0	
Shreveport	0	0		0		0	2	0	2	0	0	
Texas:												
Dallas	4	0		0	4	0	3	0	12	0	0	1
Galveston	0	0		0		0	0	0	0	0	0	
Houston	5	0		0		0	3	0	12	0	0	
San Antonio	1	0		0	1	0	2	0	0	0	0	
MOUNTAIN												
Montana:												
Billings	0	0		0		0	0	0	0	0	0	
Great Falls	0	0		0		0	2	0	0	0	0	
Helena	0	0		0		0	0	0	1	0	0	
Missoula	0	0		0		0	2	0	0	0	0	
Idaho:												
Boise	0	0		0		0	0	0	0	0	0	
Colorado:												
Pueblo	0	0		0		0	2	0	5	0	0	
Utah:												
Salt Lake City	0	0		0		0	0	0	3	0	0	2

City reports for week ended Nov. 24, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza Cases	Influenza Deaths	Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
PACIFIC												
Washington:												
Spokane	0	0		0	8	0	1	0	0	0	0	11
Tacoma	0	0		0	36	0	0	0	1	0	0	3
California:												
Los Angeles	3	0	9	1	8	0	4	7	29	0	0	11
Sacramento	2	1		0	3	0	0	0	2	0	0	2
San Francisco	1	0		0	55	3	8	5	13	0	0	2
Total	95	2	96	16	465	23	292	51	595	0	5	568
Corresponding week, 1944	83		46	29	170		350		844	0	8	440
Average, 1940–44	87		252	[1] 33	[2] 805		[1] 393		792	1	17	933

[1] 3-year average, 1942–44.
[2] 5-year median, 1940–44.

Dysentery, amebic.—Cases: New York, 3; Chicago, 1; San Francisco, 1.
Dysentery, bacillary.—Cases: Boston, 2; Providence, 1; New York, 14; Philadelphia, 2; Detroit, 1; Los Angeles, 5.
Dysentery, unspecified.—Cases: Richmond, 1; San Antonio, 10.
Tularemia.—Cases: Reading, 1; Indianapolis, 1.
Typhus fever, endemic.—Cases: New York, 3; Atlanta, 9; Savannah, 1; Tampa, 1; Mobile, 1; New Orleans, 4; Houston, 2; San Antonio, 1; Los Angeles, 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1943, 33,489,100)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza Case rates	Influenza Death rates	Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
New England	13.1	0.0	2.6	0.0	32	2.6	78.8	18.4	163	0.0	2.6	203
Middle Atlantic	6.9	0.5	4.2	2.3	45	3.7	43.0	2.3	67	0.0	0.5	77
East North Central	12.8	0.0	18.5	1.2	125	2.4	32.4	6.1	106	0.0	0.6	137
West North Central	9.9	0.0	9.9	4.0	70	8.0	59.7	23.9	141	0.0	2.0	46
South Atlantic	40.2	0.0	67.0	3.3	5	0.0	51.9	3.3	82	0.0	1.7	65
East South Central	29.5	0.0	53.1	17.7	6	11.8	106.2	17.7	59	0.0	0.0	41
West South Central	40.2	0.0	2.9	2.9	20	2.9	51.7	0.0	89	0.0	0.0	3
Mountain	0.0	0.0	0.0	0.0	0	0.0	97.7	0.0	147	0.0	0.0	33
Pacific	10.9	1.8	16.4	1.8	191	5.5	23.7	21.9	82	0.0	0.0	53
Total	14.8	0.3	15.0	2.5	73	3.6	45.6	8.0	93	0.0	0.8	89

FOREIGN REPORTS

ANGOLA

Notifiable diseases—April and May 1945.—During the months of April and May 1945, certain notifiable diseases were reported in Angola (Portuguese West Africa) as follows:

Disease	April		May	
	Cases	Deaths	Cases	Deaths
Beriberi	11		17	1
Bilharziasis	263		369	
Cerebrospinal meningitis	11	1	10	1
Chickenpox	2		8	
Dengue	5		1	
Diphtheria	1		3	1
Dysentery:				
Amebic	111	1	178	9
Bacillary	1	1	3	
Erysipelas			1	
Gonorrhea	577		213	
Hookworm disease	518	7	714	16
Influenza	1,104	6	1,328	21
Leprosy	18	1	5	1
Lethargic encephalitis	1			
Measles	60	1	46	
Mumps	19		12	
Pneumonia (all forms)	249	24	231	31
Poliomyelitis	3		3	
Relapsing fever	43	1	47	
Scurvy			1	
Septicemia	1		4	1
Smallpox (including alastrim)	10		20	
Syphilis	393		577	
Tetanus	4	2	8	3
Trypanosomiasis	242	12	149	15
Tuberculosis (pulmonary)	53	7	44	5
Typhoid and paratyphoid fever	13		4	1
Whooping cough	26		41	1
Yaws	830		961	1

NOTE.—Report for June has not been received.

BRITISH EAST AFRICA

Kenya—Relapsing fever.—Up to November 28, 1945, 315 cases of relapsing fever had been reported in Kenya, with mortality high in untreated cases. The disease, which is believed to be louse-borne, was originally centered in Mariakani but has spread from Mombasa to 50 miles inland in Kilifi and Digo coastal districts.

CHINA

Notifiable diseases—July 1945.—During the month of July 1945, certain notifiable diseases were reported by the Army Medical Administration, Health Department of the Board of Supplies and Transport, the Chinese Red Cross Medical Corps, and the National Health Administration of China, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	15	2	Relapsing fever	765	10
Cholera	4,522	1,578	Scarlet fever	11	1
Diphtheria	29	3	Smallpox	25	
Dysentery	4,407	142	Typhoid fever	444	13
Plague	17	10	Typhus fever	214	3

CUBA

Habana—Communicable diseases—4 weeks ended November 10, 1945.—During the 4 weeks ended November 10, 1945, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	25		Tuberculosis	13	10
Malaria	2		Typhoid fever	15	3

Provinces—Notifiable diseases—4 weeks ended November 3, 1945.—During the 4 weeks ended November 3, 1945, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana [1]	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			6	6		21	33
Diphtheria	4	21	2	3	1	2	33
Hookworm disease		13					13
Leprosy		14	1			8	23
Malaria	20	4	3	2	12	259	300
Measles		1					1
Poliomyelitis		1					1
Trachoma				1			1
Tuberculosis	4	43	21	21	39	40	168
Typhoid fever	46	29	10	99	24	111	319
Typhus fever		1					1
Whooping cough		1					1
Yaws						2	2

[1] Includes the city of Habana.

NEW ZEALAND

Notifiable diseases—4 weeks ended November 3, 1945.—During the 4 weeks ended November 3, 1945, certain notifiable diseases were reported in New Zealand as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Beriberi	52		Lethargic encephalitis	1	
Cerebrospinal meningitis	12	2	Malaria	8	
Diphtheria	79	5	Poliomyelitis	2	
Dysentery:			Puerperal fever	5	
Amebic	3	1	Scarlet fever	207	1
Bacillary	15		Tuberculosis (all forms)	214	45
Erysipelas	18		Typhoid fever	10	
Food poisoning	2		Undulant fever	2	
Lead poisoning	1				

REPORTS OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER RECEIVED DURING THE CURRENT WEEK

NOTE.—Except in cases of unusual incidence, only those places are included which had not previously reported any of the above-mentioned diseases, except yellow fever, during the current year. All reports of yellow fever are published currently.

A table showing the accumulated figures for these diseases for the year to date is published in the PUBLIC HEALTH REPORTS for the last Friday in each month.

Plague

Argentina—Tucuman Province—Las Canitas.—For the month of October 1945, 1 case of plague with 1 death was reported in Las Canitas, Tucuman Province, Argentina.

New Caledonia—Loyalty Islands—Mare Island.—A report dated September 1945, stated that during the past few months an outbreak of pneumonic plague had occurred on the island of Mare, Loyalty Islands, New Caledonia, where 60 cases and 30 deaths were reported.

Smallpox

British East Africa—Tanganyika.—For the week ended November 3, 1945, 583 cases of smallpox with 51 deaths were reported in Tanganyika, British East Africa.

Morocco (French).—Smallpox has been reported in French Morocco as follows: November 1–10, 1945, 148 cases; November 11–20, 1945, 112 cases.

Rhodesia, Northern.—For the week ended November 3, 1945, 507 cases of smallpox were reported in Northern Rhodesia.

Union of South Africa.—For the month of September 1945, 223 cases of smallpox with 10 deaths were reported in the Union of South Africa.

Typhus Fever

Chile.—For the period September 9 to October 6, 1945, 54 cases of typhus fever with 4 deaths were reported in Chile. Provinces reporting the highest incidence are as follows: Nuble, 17 cases; Concepcion, 7 cases, 1 death; Valdivia, 6 cases.

Great Britain—England.—For the week ended November 10, 1945, 2 cases of typhus fever were reported in Canterbury and 1 case of typhus fever was reported in Hampstead, London, England.

Hungary.—For the period January 1 to September 1, 1945, it is reported that from 8,000 to 10,000 cases of typhus fever had occurred in Hungary.

Morocco (French).—Typhus fever has been reported in French Morocco as follows: November 1–10, 1945, 90 cases; November 11–20, 1945, 57 cases.

Turkey.—For the week ended November 17, 1945, 32 cases of typhus fever were reported in Turkey, including 3 cases in Erzurum, 4 cases in Istanbul, 1 case in Izmir, 1 case in Kocaeli, 3 cases in Seyhan, and 2 cases in Zonguldak. For the week ended November 24, 1945, typhus fever was reported as follows: All of Turkey, 18 cases, including 1 case in Ankara, 1 case in Canakkale, and 5 cases in Istanbul.

Union of South Africa.—For the month of September 1945, 101 cases of typhus fever were reported in the Union of South Africa.

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FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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Public Health Reports

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NOTES ON COMPULSORY SICKNESS INSURANCE LEGISLATION IN THE STATES, 1939–44[1]

By Adela Stucke, *Assistant Statistician, United States Public Health Service*[2]

Although popular interest in compulsory sickness insurance[3] legislation was aroused by the introduction into Congress of Senator Wagner's proposal for a national health program (S. 1620) in 1939, State legislatures have enacted few laws of this type. Throughout the course of the 6 years from 1939 through 1944, only 14 States considered legislation relating to some aspect of compulsory sickness insurance. Of the 116 bills introduced in these States, 11 were enacted into law. Twenty-seven bills were introduced in 1939–40, 35 in 1941–42, and 54 in 1943–44. Of the 11 laws passed, 2 were enacted in the first biennium, 2 in the second, and 7 in the third.[4]

That the percentage of bills passed was so small is evidence of indifference or opposition to the subject. However, another factor contributing to the small percentage of enactments in relation to bills introduced is that final action may be taken on but one of two companion bills introduced at the same time in both branches of the legislature or on the last version of a succession of amended drafts, each of which has been assigned a different number.

If any bills have been overlooked inadvertently in this survey, the number would be so small that there would be no distortion of the picture of behavior of State legislatures with respect to compulsory sickness insurance.

[1] From the Division of Public Health Methods.

[2] Now with the Bureau of Labor Statistics, Department of Labor, Washington, D. C.

[3] The term "sickness insurance" is interpreted in this paper to include cash benefits for the loss of income during illness, as well as reimbursement for the cost of medical and surgical aid or the furnishing of such aid in kind.

[4] The period under discussion in this report has been divided into biennia since a majority of the States meet in legislative session only every other year; most of these convene during the odd years.

State proposals for compulsory sickness insurance may be divided into two main categories:

1. Legislation designed to establish a compulsory sickness program within an existing unemployment compensation system.

2. Legislation providing for independent administration of sickness benefits and drawn in conformance with the principles of the model health insurance bill of the American Association for Social Security, commonly known as the "Epstein bill." [5]

SICKNESS INSURANCE WITHIN EXISTING UNEMPLOYMENT COMPENSATION SYSTEM

Attempts were made in 11 States [6] to enact legislation embracing the first type of compulsory sickness insurance, which may in turn be divided into two categories according to the manner in which the program is financed: (1) Cash sickness funds collected and maintained apart from the regular unemployment compensation funds; (2) the same funds used to pay both disability benefits and unemployment compensation benefits.

Program financed from separate cash sickness funds.—Thirty-seven bills were introduced in 7 States (California, Connecticut, Maine, New Hampshire, New Jersey, Rhode Island, and Washington) during 1939–44 proposing either to establish a system of sickness insurance administered jointly with unemployment compensation and maintaining separate funds, or to amend the one existing State law in this field (table 1, column 8). Bills in the latter classification, of which there were 21, will be discussed in another section of this paper.

Of the 16 remaining bills, 7 were presented to the California legislature. Six of these were identical, companion bills being introduced in both houses during each regular session (S. 1127 and A. 2172 in 1939, S. 645 and A. 1730 in 1941, and S. 885 and A. 1079 in 1943). Assembly bill No. A. 2172 was the only one to receive any legislative action after its initial referral to committee, having been defeated in the 1939 Assembly by a vote of 48 to 20.[7] These measures proposed to amend the California Unemployment Reserves Act of 1935 by changing the title to the Social Insurance Act and providing for a plan of compulsory health insurance to be integrated with the system of unemployment insurance. Medical benefits under the contemplated program were to be administered by a Bureau of Medical Service to be created in the Department of Employment, although the Division of

[5] Epstein, Abraham: The revised model bill for health insurance, Social Security, March 1940, vol. 14, No. 3, pp. 5–7.

[6] California, Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, South Carolina, and Washington.

[7] Shearon, Marjorie: A review of State legislation relating to medical services and to cash payments for disability, proposed during 1939. Soc. Sec. Bull., 3: 34–51 (1940).

Public Employment Offices and Benefit Payments was to be utilized to collect, account for, prepare the records, and do the disbursing for unemployment compensation, as well as for disability benefits and medical benefits. Not only was the health insurance plan to be linked closely with the unemployment compensation system administratively, but it was partly dependent upon the latter program for financial resources, as indicated by the composition of the health insurance fund.

Senate bill No. 879, introduced in California in 1943, differed from the six above-mentioned bills in that medical benefits were excluded from its provisions. The program of disability unemployment insurance which it proposed to establish was to be financed by utilizing that part of the unemployment contributions which employees had been making (1 percent of wages) and such appropriations for disability benefits as might be made from Federal funds. This bill too died in the Senate.

Rhode Island law.—Two bills were introduced in Rhode Island in 1942, one of which (S. 171) became the first State compulsory cash sickness compensation law in the Nation. The Rhode Island law (Ch. 1200, Laws 1942) became effective May 10, 1942; taxes under the act were levied starting June 1, 1942; and benefits were payable on and after April 1, 1943. The cash sickness benefits program is administered jointly with the unemployment insurance system in that the same personnel and machinery are utilized and the same benefit formula and coverage apply. However, a separate fund is maintained for the payment of sickness benefits and, aside from interest on investments, it has been built up entirely by contributions of covered employees—1 percent of their earnings up to $3,000.

This method of financing did not impose any additional hardship on covered employees in Rhode Island since they had been contributing 1.5 percent of their wages for unemployment benefits, and with the passage of the sickness compensation law the unemployment contributions were reduced to 0.5 percent. Thus, an employee now pays no more for a combination of unemployment insurance and sickness benefits than he previously paid for the former alone.

The Rhode Island law, as originally enacted, limited the amount which could be used for administering the cash sickness program to 1 percent of the contributions collected. Later this was increased to 3 percent (Ch. 1481, Laws 1944).

As a means of preventing malingering, the law specified that a claimant must see a doctor within 5 days after the start of an illness and, in most instances, at least once a week thereafter until he can return to work. In addition, a medical panel was added to the administrative staff of the Rhode Island Unemployment Compensation Board to review the certifications of doctors and to examine question-

able claims. In spite of these control measures, cash sickness benefit payments have been considerably in excess of expectations. During the first full year of operations, 32,624 claimants, or more than 1 out of every 8 wage earners covered, received $3,881,162.07 in benefits.[8] Undoubtedly the development of this situation may be attributed in part to the liberal definition of "sickness" under the act. The Rhode Island law was enacted without precedents upon which to work, and it is to be expected that experience under its provisions would expose defects in this legislation.

Amendments to Rhode Island Cash Sickness Compensation Act.— The fact that Rhode Island is the only State to have enacted legislation providing cash benefits for unemployment due to illness lends particular significance to the bills which have been introduced in amendment of the act. Three amendments proposed in 1943 were all enacted. The first (S. 120, Ch. 1369) permitted the Unemployment Compensation Board, on the Governor's authorization, to modify the scale of sickness benefits, to increase the waiting period, or to make any other changes in the regulations covering eligibility for payment of benefits which the board found necessary to keep the cash sickness fund solvent. The second (S. 177, Ch. 1368) exempted Christian Scientists from the provisions of the act. And the third (H. 786, Ch. 1367) provided that employees should be entitled to cash benefits even though they continued to receive wages during periods of illness because of a previous agreement with the employer or if they received Workmen's Compensation or primary insurance benefits under Title II of the Social Security Act (Old-Age and Survivor's Insurance). This provision has been criticized [9] as unsound because through it a worker would receive more compensation while he is sick than when he is at work. It is feared that malingering would be fostered, thus nullifying the intent of social insurance.

In 1944, there were 18 proposed amendments to the Rhode Island act, but only 2 of these became laws. The first of the enactments (S. 96, Ch. 1412) provided that the term "contributions"—the payments made into the fund—be construed to mean "taxes." Thus, such contributions would be no longer taxable.[10] The second (H. 524, Ch. 1481) increased from 1 to 3 percent the portion of the sickness fund to be made available to the unemployment compensation board for administrative purposes.

Only the more important of the 16 bills which failed of enactment during 1944 need be mentioned here. Three of these (H. 520, H. 523, and H. 526) sought to repeal H. 786, Ch. 1367, the third 1943 amend-

[8] Rhode Island Unemployment Compensation Board: Summary of the cash sickness insurance program in Rhode Island for the benefit year 1943–44 (Dec. 1, 1944).

[9] State Advisory Council, Division of Employment Security, the Commonwealth of Massachusetts: Report on sickness benefits (Nov. 1, 1944).

[10] Letter from John H. Nolan, Attorney General of Rhode Island, to Deputy Collector in Charge, Treasury Department, Internal Revenue Service, Providence, R. I.

ment described above. Two bills (H. 787 and H. 891) sought to increase the coverage of the act by placing under it social agency workers and employers with two or three employees.

The provisions of the Rhode Island act are very generous with regard to maternity benefits, inasmuch as no distinction is made between pregnancy and other forms of "sickness." It is possible, under this law, for an expectant mother to receive the maximum total amount of benefits payable under the act. In an effort to tighten the provisions with respect to benefits during pregnancy, a proposal was made to limit the period for which such benefits would be payable to "a period of 10 weeks following completion of the required waiting period, or for such number of weeks as said claimant may have benefit credits available, whichever period is shorter" (H. 521).

Two other bills (S. 72 and H. 684) proposed to reduce the waiting period in Rhode Island from 1 week to 3 consecutive days; to eliminate the provision for an additional waiting period for each succeeding period of illness; and not to count any week in which he received unemployment compensation benefits toward an individual's required waiting period. Amendments were also proposed to increase the employee contribution to the cash sickness fund from 1 to 1.5 percent, and at the same time to repeal the 0.5 percent unemployment compensation tax now paid by employers, the intent being to transfer unemployment funds to help finance the cash sickness benefits program (H. 525 and H. 610).

Of the 16 proposals to amend the Rhode Island Cash Sickness Compensation Act which failed of enactment during 1944, not one received any legislative action after it was referred to committee.

Representatives from other States have gone to Rhode Island from time to time to study the cash sickness law and the operation of its sickness benefits program, and as a result similar enactments have been attempted elsewhere. Connecticut, Maine, and Washington introduced during the 1943 session bills (H. 591, H. 1211, and H. 245, respectively) which were closely patterned after the Rhode Island law. All three proposals died in the lower house. The New Hampshire Commission on Disability Benefits prepared a draft bill embodying many of its provisions, and a bill (H. 341) based on this draft was introduced during 1943 by the House Committee on Rules; but it too failed of enactment.

In 1944 the New Hampshire Legislature used a somewhat different approach toward solving the problem of providing benefits for sick employees in a bill (H. 352-x) reported to have been sponsored by the Manufacturers' Association of that State. This measure provided

that the Commissioner of Labor set up minimum standards applying to sickness and disability insurance, and then required every employer covered by the unemployment compensation law either to purchase a policy conforming to the minimum standards from a private insurance company or to arrange for a similar insurance plan of his own. Thus, it would appear that employers in New Hampshire were endeavoring to keep health insurance in the hands of private carriers rather than to have government enter the business. This bill also was allowed to die in the House.

The only other State in which legislation was proposed to combine unemployment compensation and cash sickness benefits while maintaining separate funds for their operation was New Jersey. Two such bills (S. 100 and A. 61) were defeated in that State in 1944. The Senate bill was the more interesting of the two in that it sought to recover from the Federal Government all unemployment contributions paid up to that time by employees and divert them to the cash sickness compensation fund.

Program financed from unemployment compensation funds.—In 6 States (California, Massachusetts, New York, Pennsylvania, Rhode Island, and South Carolina) 41 bills were introduced during the years 1939–44 to expand the provisions of their respective unemployment compensation laws to include benefits for employees unable to work because of illness or other physical disability (see table 1, column 9). In most instances it was proposed to accomplish this by the simple device of changing the definition of "unemployment" in the existing unemployment insurance laws; some bills would have amended the qualifying provisions of the law in regard to "benefit eligibility conditions;" and others merely stated that "any person absent from work on account of sickness shall not therefor be debarred from receiving benefits under the law providing unemployment compensation."

Massachusetts and New York were the two most active States with respect to the volume of bills presented to their legislatures. In the former State, bills to provide "unemployment benefits to persons leaving employment because of injury, sickness, or accident" were introduced as follows: 6 in 1939, 11 in 1941, and 5 in 1943. All of the 1939 bills were killed in both houses of the legislature, the 1941 bills were withdrawn from both houses, and the 1943 bills were reported by a substitute bill which requested that a study be made of the questions involved. Bills in this category were presented to the New York legislature in each session after 1939. The 1941 bill (A. 121) was passed by both houses, but it was vetoed by the Governor. Eleven other bills introduced in subsequent years were allowed to die in the branch of the legislature where they originated.

There were six bills introduced in the four remaining States, one in California, two in Pennsylvania, two in Rhode Island, and one in South Carolina. These measures also failed of enactment.

SICKNESS INSURANCE WITH ADMINISTRATION INDEPENDENT OF OTHER INSURANCE SYSTEMS

The second type of proposal for compulsory sickness insurance (i. e., a sickness benefits program separate from any other insurance system) appeared in 28 bills introduced by 10 States during the years 1939–44 (table 1, column 10). Proposals made in 1941 in Connecticut (S. 529 and H. 1979), Oregon (H. 203), and Washington (S. 247) followed exactly the 1940 revised version of the model health insurance bill of the American Association for Social Security (the "Epstein bill").

In New York identical bills were introduced in 1939 (A. 2241), 1940 (S. 1445, A. 1812, and A. 1842), 1941 (S. 313 and A. 371), 1942 (A. 905), and 1943 (S. 34 and A. 58) which were almost the same as the Epstein bill, the only change being that administrative authority was to be placed in a health insurance board which was to be created in the State Department of Health instead of being established as an independent body. Five other proposals in New York were based upon the model bill. One of these (A. 1710) differed only in that nonmanual workers earning $30 a week or more were not excluded from benefits, and maternity benefits were increased from $15 to $25. Assembly bill 28, introduced in 1943, and two 1944 bills (A. 197 and S. 409) varied from the model bill on several other counts.

Proposals made in Missouri in 1941 (H. 617) and in Rhode Island in 1940 (H. 658) were based on the model bill originally sponsored by the American Association for Social Security in 1934, rather than on the 1940 version. Some of the changes made by the later Association draft were not included in the Missouri and Rhode Island bills, thus distinguishing them from those introduced in previously mentioned States. The changes are outlined as follows: (1) The waiting period was increased from 5 to 7 days; (2) nonmanual workers earning over $1,500 instead of $3,000 were excluded from benefits; (3) the method of paying cash benefits was changed from that of a percentage of wages for each day of loss to that of flat benefits, in accordance with the size of family, for each week of loss.

Since 1939 at each of the regular sessions of the Wisconsin legislature there was introduced a compulsory health insurance bill (A. 807 in 1939, A. 586 in 1941, and A. 327 in 1943) differing from both the model bill and other bills in this field. Contributions to the health insurance fund were to be paid only by employers and employees (there being no provision for State participation) on a flat 2-percent basis for each group instead of being graduated. Like A. 1452 in New York, the Wisconsin measure provided for "health benefits" (i. e., medical services) but not for cash benefits.

None of the bills proposing the establishment of an independent system of compulsory sickness insurance was enacted, and few received any legislative action after first referral to committee.

TABLE 1.—*Classification of State compulsory sickness insurance bills: 1939–44*

State	Year						Classification of bills by type of administration and types of sickness fund			Final disposition
							Administration linked to unemployment compensation		Administration and sickness fund independent of unemployment compensation	
	1939	1940	1941	1942	1943	1944	Financed from separate cash sickness funds	Financed from unemployment compensation funds		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
California	x								S. 551	Died in Senate.
			x				S. 645			Do.
					x		S. 879			Do.
					x		S. 885			Do.
	x						S. 1128			Do.
			x					A. 2		Died in Assembly.
					x		A. 1079			Do.
			x				A. 1730			Do.
	x						A. 2172			Killed in Assembly.
Connecticut			x						S. 529	Died in Senate.
					x		H. 591			Do.
			x						H. 1979	Died in House.
Maine					x		H. 1211			Do.
Massachusetts					x			S. 229		Reported by substitute S. 443.[1]
			x					S. 248		Killed in Senate.
			x					S. 256		Withdrawn from both Houses.
			x					H. 284		Do.
	x							H. 387		Killed in both Houses.
					x			H. 450		Reported by substitute H. 668.[2]
					x			H. 458		Reported by substitute S. 443.[1]
			x					H. 571		Withdrawn from both Houses.
			x					H. 795		Do.
			x					H. 796		Do.
	x							H. 933		Killed in both Houses.
	x							H. 1075		Do.
			x					H. 1120		Withdrawn from both Houses.
			x					H. 1121		Do.
					x			H. 1124		Reported by substitute S. 443.[1]
			x					H. 1132		Withdrawn from both Houses.[1]
					x			H. 1133		Reported by substitute S. 443.[1]
	x							H. 1651		Killed in both Houses.
			x					H. 1754		Withdrawn from both Houses.
			x					H. 1760		Do.
	x							H. 1781		Killed in both Houses.
	x							H. 1876		Do.
	x								H. 1898	Do.
Missouri			x						H. 617	Died in House.
New Hampshire					x		H. 341			Do.
						x	H. 352-x			Do.
New Jersey						x	S. 100			Died in Senate.
						x	A. 61			Died in Assembly.
New York					x				S. 34	Died in Senate.
			x						S. 318	Do.
					x			S. 377		Do.
						x			S. 409	Do.
				x				S. 740		Do.
		x							S. 1445	Do.
				x				S. 1536		Do.
				x				S. 1881		Do.
					x				A. 28	Died in Assembly.
					x				A. 58	Do.
		x						A. 121		Vetoed Apr. 13, 1940.

See footnotes at end of table.

TABLE 1.—*Classification of State compulsory sickness insurance bills: 1939–44*—Continued

State	Year						Classification of bills by type of administration and types of sickness fund			Final disposition
							Administration linked to unemployment compensation		Administration and sickness fund independent of unemployment compensation	
	1939	1940	1941	1942	1943	1944	Financed from separate cash sickness funds	Financed from unemployment compensation funds		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
New York						x			A. 197	Died in Assembly.
			x					A. 316		Do.
			x						A. 371	Do.
					x			A. 498		Do.
						x		A. 530		Do.
					x			A. 638		Do.
				x				A. 895		Do.
				x					A. 905	Do.
						x			A. 1452	Do.
				x				A. 1642		Do.
				x				A. 1678		Do.
					x				A. 1710	Do.
		x							A. 1812	Do.
		x							A. 1842	Do.
	x								A. 2241	Do.
	x								A. 2252	Do.
Oregon			x						H. 203	Died in House.
Pennsylvania	x							H. 27–x		Do.
	x							H. 450		Do.
	x								H. 671	Do.
Rhode Island						x	S. 72			Died in Senate.
						x	S. 96			Approved, Mar. 7, 1944.
						x	S. 110			Died in Senate.
					x		S. 120			Approved Apr. 28, 1943.
				x			S. 171			Approved Apr. 29, 1942.
					x		S. 177			Approved Apr. 28, 1943.
						x	H. 518			Died in House.
						x	H. 519			Do.
						x	H. 520			Do.
						x	H. 521			Do.
						x	H. 522			Do.
						x	H. 523			Do.
						x	H. 524			Approved Apr. 24, 1944.
						x	H. 525			Died in House.
						x	H. 526			Do.
						x	H. 591			Do.
			x					H. 610		Do.
						x	H. 610			Do.
		x							H. 858	Do.
						x	H. 684			Do.
						x	H. 753			Died in Senate.
					x		H. 786			Approved Apr. 28, 1943.
						x	H. 787			Died in Senate.
	x								H. 809	Died in House.
		x						H. 885		Do.
						x	H. 891			Died in Senate.
				x				H. 902		Died in House.
				x			H. 957			Died in Senate.
South Carolina		x						H. 2088		Died in House.
Washington			x						S. 247	Killed in Senate.
					x		H. 245			Died in House.
Wisconsin					x				A. 327	Killed in House.
			x						A. 586	Died in House.
	x								A. 807	Killed in Assembly.
Total	16	8	24	10	23	26	37	41	28	

[1] S. 448 was a resolution substituted for S. 229, H. 458, H. 1124, and H. 115[illegible], which provided for an investigation by a special commission relative to the payment of unemployment compensation benefits to employees absent from work on account of sickness. It was reported, in turn, by substitute H. 1853 which became Ch. Res. 54, Laws 1943.

[2] H. 808, substituted for H. 450, became Ch. 534, Laws 1943. The law as finally enacted did not relate to compulsory sickness insurance.

LEGISLATION PROPOSING STUDY OF SICKNESS INSURANCE

Aside from the "Rhode Island Cash Sickness Compensation Act" and amendments thereto, no other State legislation relating to compulsory sickness insurance was passed during the 6-year period 1939–44 with the exception of a few laws authorizing the appointment of commissions to study and report on the problems involved (see table 2). Connecticut twice, once in 1939 (H. 1495) and again in 1943 (S. 635), failed to pass bills providing for the study and investigation of the "subject of a system of health insurance for the people of the State."

TABLE 2.—*Scope and final disposition of State bills proposing study of sickness insurance, 1939–44*

State	Bill No.	Year	Scope	Final disposition
Connecticut	H. 1495	1939	Provides appointment of commission to study health insurance.	Killed in House.
	S. 635	1943	do	Killed in Senate.
Maryland	H. J. Res. 32	1939	Requests Governor to appoint commission to study compulsory hospital insurance.	Approved Apr. 26.
Massachusetts	S. 443	1943	Establishes commission to study payment of unemployment compensation benefits to workers absent because of sickness.	Reported by substitute H. 1852.
	H. 1852	1943	do	Approved June 11.
New Hampshire	H. 327	1939	Establishes commission to study protection of persons unemployed because of sickness.	Approved June 16.
	S. 82	1941	Extends Commission on Disability Benefits.	Approved May 20.
	S. 93	1943	do	Do.
New York	A. Res. (CCH 44)	1944	Provides industrial commissioner have study made re: extension of unemployment insurance law to cover those unemployed because of illness.	Died in Assembly.

NOTE.—In 1943, Rhode Island introduced a bill (S. 60) to create a special commission to study the advisability of postponing for one full year the provisions of its cash sickness compensation act.

Maryland, on the other hand, passed a law in 1939 (Joint Resolution 12), the purpose of which was "to explore the possibility of transforming voluntary hospital insurance into compulsory hospital insurance" (see footnote 7, page 1552). Under this law the Governor was requested to appoint a commission to study the subject and to report to the General Assembly on or before January 15, 1941. However, insofar as this author has been able to ascertain, nothing came of this law; the commission apparently was never designated.

Two bills (S. 443 and H. 1852) were introduced in Massachusetts in 1943 providing for an investigation relative to the payment of unemployment compensation benefits to employees absent from work on account of sickness. The house bill, which became law (Ch. Res. 54, Laws 1943), directed the State Advisory Council in the Division of Employment Security to make the investigation and to report its findings by November 1944.

In connection with the preparation of its report (see footnote 9, page 1554), the Council conducted a series of informal hearings with representatives of various interested groups to ascertain their attitude toward a State compulsory program of sickness benefits. As a result it was determined that: (1) The greatest fear of manufacturers was that the additional tax burden would place them at a competitive disadvantage with employers in other States; (2) insurance companies questioned the advisability of beginning such a program during the present period of emergency and unsettled conditions, particularly since the influx of women into industry in wartime would create an extra drain on the funds of the system; (3) the medical group was apprehensive that medical care would eventually be regimented in the hands of a bureaucracy; and (4) the two largest groups of organized labor in the State appeared to be divided: Of these two groups, one favored very definitely a State compulsory plan of sickness benefits, even if the workers must finance the program; in the other group, the officials of the State headquarters objected to any program which the employees would have to carry alone. The "rank and file of labor who attended hearings throughout the State" approved the plan even to the extent of employee participation.

One of the major issues which confronted the Advisory Council was the method of administering a program of disability benefits. It was pointed out that the objectives of the proposed plan were similar to those of unemployment compensation and that the same machinery and procedures could be utilized for the collection of contributions, the filing of wage record data, and the payment of claims. However, existing legislation would necessitate establishing separate funds for the two programs, both for the payment of benefits and for administrative purposes. Employer contributions under the Massachusetts Employment Security Law may be used only for the payment of benefits to those unemployed because of lack of work, and the Federal Social Security Board has ruled that no funds under Title III of the Social Security Act will be furnished to a State to be used in the administration of a sickness benefits plan. "The only solution to their use for both programs would be an amendment to the Social Security Act eliminating the qualifying provision of 'availability for work,' thus permitting benefits for unemployment caused by either lack of work or by sickness" (see footnote 9, p. 1554).

Linking sickness benefits with Workmen's Compensation was suggested as another device for administering a system of cash sickness compensation. It was noted that a disability benefits program could be regarded as bearing a greater resemblance to Workmen's Compensation than to Unemployment Compensation for the reason that when a person is unemployed due to illness or accident he is retained on the

payroll even though he is unable to work; whereas under Unemployment Compensation, to be eligible for benefits, the individual must be unemployed because of lack of work and he must be available to take another job. It is to be presumed that under such an arrangement the employer would be compelled to insure his employees against the perils of nonoccupational accidents and illness in the same manner that he now is required to provide for their insurance against occupational accidents or illness.

Still another observation was offered to the effect that it might be desirable to extend the coverage of the sickness insurance system to the entire working population and not restrict it to those employees covered by either Workmen's Compensation or Unemployment Compensation. In that event persons whose income is not subject to payroll accounting would undoubtedly be included under the plan, thus making it impracticable to base benefit payments on earnings and to collect wage record data and contributions at the source, in accordance with "the accepted insurance principle." "Coverage of the entire working population would presuppose the imposition of a flat premium, with perhaps a flat amount as a benefit, based on salary ranges rather than specific earnings, similar to private insurance methods."

In concluding its report, the Massachusetts State Advisory Council recommended further study of the subject after conditions become more normal and better judgment on some of the unknown factors may be forthcoming.

The New Hampshire Commission on Disability Benefits, established by law in 1939 (H. 327, Ch. 206) and continued by two successive acts (Ch. 117, Laws 1941, and Ch. 211, Laws 1943), submitted two reports on its findings.[11]

The first of these affirmed the need for a program of disability insurance in the State; it estimated the cost of such a program, recommending that it be financed by a tax not to exceed 1 percent of pay roll; and it outlined a tentative plan for administering a cash sickness compensation system in conjunction with unemployment insurance.

The second report presented the opinion that complete coverage of the working population could be achieved only through a compulsory system of disability insurance. Summarized also in the supplementary report were the results of the Commission's efforts to determine the attitude of the Federal Social Security Board with regard to utilization by the State of unemployment compensation facilities for the administration of a cash sickness benefits program.

[11] The New Hampshire Commission on Disability Benefits: Report to His Excellency Robert O. Blood, Governor of New Hampshire (1941).

The New Hampshire Commission on Disability Benefits: Supplemental Report to His Excellency Robert O. Blood, Governor of New Hampshire (1943).

The Commission recommended (1943 report) that "operation of such a system in New Hampshire be deferred until doubts relative to the possibility of joint administration are dispelled."

New York was the only State in which a bill was introduced in 1944 (CCH Assembly Bill No. 44) requesting that a study be made of both the need for, and the estimated cost of, liberalizing the unemployment insurance law so as to extend benefits to persons who become unemployed because of sickness. This bill was allowed to die in assembly.

LEGISLATIVE TRENDS

During the period 1939–44, 44 State legislatures held 3 regular biennial meetings and 4 legislatures held 6 annual meetings. In this time 116 bills dealing with some phase of compulsory sickness insurance were introduced in 14 States. Twenty-eight bills proposed State-wide systems of compulsory health insurance; 37 bills provided for plans of sickness benefits to be administered in conjunction with unemployment insurance but financed from separate funds; 41 bills called for the extension of unemployment compensation benefits to persons absent from work on account of illness; and 10 bills authorized or requested that studies be made of the various problems connected with compulsory sickness insurance.

The only legislation enacted was the Rhode Island Sickness Compensation Act of 1940, several amendments thereto, and laws providing for the study of health insurance in Maryland, Massachusetts, and New Hampshire. Although the volume of legislation concerned with compulsory sickness insurance introduced in the biennium 1943–44 was double that of 1939–40, the number of States considering such legislation was the same in both periods. Thus it would appear that a few industrial States in the East and the far West are becoming more interested in the subject, but that by far the greater part of the country has not been concerned with the development of State sickness insurance programs.

Indications are that this latter tendency is undergoing somewhat of a change. During the first 3 months of 1945, legislation in this field was introduced for the first time in six widely dispersed and mainly nonindustrial States (Colorado, Minnesota, Montana, Nevada, New Mexico, and North Carolina). Through March 1945, 50 bills were presented to the legislatures of 13 States,[12] while in 1941, the year of greatest activity during the 6 years covered in this paper, only 27 bills were introduced in 10 States. Not only are there signs of increasing interest in the States in the whole subject of compulsory sickness insurance, but the most noticeable trend in this field is the favor shown toward legislation which adds cash or cash and medical

[12] The 7 other States are California, Connecticut, Massachusetts, New Jersey, New York, Rhode Island, and Washington.

benefits to existing unemployment insurance programs. Already 39 bills of this type have been introduced, 9 providing for the extension of unemployment compensation funds for this purpose, 22 for separate funds, and 8 proposing amendments to the Rhode Island Cash Sickness Compensation Act. Only 5 bills call for the setting up of new systems for compulsory sickness insurance, while 6 bills request that studies be made concerning the subject.

Even though the volume of legislation introduced has increased considerably, up to the present Rhode Island is the only State to have enacted a law establishing a compulsory sickness insurance program. Few bills have been reported out of committee, and where passage was affected, the bill was radically changed. For example, the State of Washington introduced a bill (S. 193) calling for a system of disability benefits to be administered jointly with its unemployment compensation program, but the law as approved on March 13, 1945, provided only that the Commissioner of Unemployment Compensation and Placement "make a study to determine the practicability and necessity of meeting the problems of unemployment in the State due to sickness, accident or injury, by the enactment of legislation which would alleviate the hardships caused by such unemployment."

Undoubtedly there are many and varied reasons for enactment of so little compulsory sickness legislation in the States. It is often difficult to ascertain why certain bills are treated with either open opposition or complete indifference, but some of the reasons for the lack of enthusiasm displayed in the States for legislation of this type are revealed in the several reports mentioned earlier in this paper. A brief summary follows:

1. The passage of compulsory sickness insurance legislation would be an entering wedge into the field of compulsory budgeting of personal expenditures and would amount to "an infringement on an individual's liberty."

2. During the present emergency people have been encouraged to buy war bonds, thus building up cash reserves, and there should be relatively few who will be unable to care for themselves for some time to come after the war.

3. In spite of much employment and higher incomes, the burden of taxation is already so great that both workers and employers can ill afford to pay for additional insurance.

4. Group insurance plans between employers and employees and private hospitalization plans especially designed for the low- and middle-income groups have developed at a phenomenal rate, thus lessening the need for compulsory insurance.

5. State legislation may be retarded in some States because of uncertainty concerning possible Government centralization of all types of social insurance, including a new Federal program of permanent and temporary disability.

On the whole, it appears that, although more and more States are becoming cognizant of the possibilities of compulsory sickness insurance as a means of protecting individuals who become ill or temporarily disabled, most State legislatures have as yet been hesitant to take positive action.

PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES

November 4–December 1, 1945

The accompanying table summarizes the prevalence of nine important communicable diseases, based on weekly telegraphic reports from State health departments. The reports from each State for each week are published in the PUBLIC HEALTH REPORTS under the section "Prevalence of disease." The table gives the number of cases of these diseases for the 4 weeks ended December 1, 1945, the number reported for the corresponding period in 1944, and the median number for the years 1940–44.

Number of reported cases of 9 communicable diseases in the United States during the 4-week period November 4–December 1, 1945, the number for the corresponding period in 1944, and the median number of cases reported for the corresponding period, 1940–44

Division	Current period	1944	5-year median	Current period	1944	5-year median	Current period	1944	5-year median
	Diphtheria			Influenza [1]			Measles [2]		
United States	2,624	1,828	1,828	25,381	7,183	7,147	8,146	2,715	10,851
New England	67	30	27	10	99	36	644	500	1,457
Middle Atlantic	77	119	125	76	19	52	1,992	398	2,748
East North Central	378	181	242	2,102	127	247	1,446	261	1,064
West North Central	207	158	158	1,701	70	77	222	142	570
South Atlantic	714	365	492	7,647	2,108	2,121	434	150	367
East South Central	412	276	222	1,114	200	296	340	65	310
West South Central	514	450	347	10,403	3,933	3,938	245	130	181
Mountain	83	54	70	2,219	454	659	683	92	738
Pacific	172	195	122	109	128	229	2,140	977	977
	Meningococcus meningitis			Poliomyelitis			Scarlet fever		
United States	397	670	314	982	997	755	10,714	12,577	10,464
New England	19	54	49	72	52	26	701	1,172	977
Middle Atlantic	98	179	91	158	435	65	1,765	2,016	1,814
East North Central	96	152	33	220	147	127	2,562	3,249	2,970
West North Central	35	37	8	116	73	60	981	1,185	1,185
South Atlantic	25	68	58	56	114	75	1,657	1,655	1,446
East South Central	40	64	20	39	40	35	784	707	785
West South Central	32	39	18	55	35	35	681	622	413
Mountain	8	12	11	30	15	20	409	669	405
Pacific	44	65	31	186	86	82	1,224	1,302	749
	Smallpox			Typhoid and paratyphoid fever			Whooping cough [2]		
United States	24	17	46	304	295	341	9,377	7,482	13,366
New England	0	0	0	23	15	14	1,317	1,162	1,287
Middle Atlantic	0	0	0	38	38	64	2,974	1,797	3,711
East North Central	8	6	21	31	31	37	2,027	1,305	2,863
West North Central	0	6	10	17	9	30	255	433	665
South Atlantic	2	2	1	49	43	75	949	983	1,420
East South Central	5	0	1	24	32	45	458	250	527
West South Central	4	1	6	74	70	76	494	717	526
Mountain	5	2	2	26	32	32	316	308	322
Pacific	0	0	3	22	25	17	587	527	1,018

[1] Mississippi and New York excluded; New York City included.
[2] Mississippi excluded.

DISEASES ABOVE MEDIAN PREVALENCE

Diphtheria.—During the 4 weeks ended December 1 there were 2,624 cases of diphtheria reported, as compared with 1,828, 1,528, and 1,904 during the corresponding period in the years 1944, 1943, and 1942, respectively. The 1940–44 median for this period was represented by the 1944 incidence (1,828 cases). Each section of the country except the Middle Atlantic reported an excess over the preceding 5-year median. While the largest numbers of cases were reported from the South Atlantic and South Central sections, the greatest relative excess over the normal seasonal expectancy was reported from the New England section where the number of cases (67) was 2.5 times the 1940–44 median. For the country as a whole the current incidence is the highest since 1939 when approximately 3,000 cases were reported during this period.

Influenza.—The number of cases of influenza rose from 8,390 during the 4 weeks ended November 3 to 25,381 during the 4 weeks ended December 1. Sharp increases were reported from some States in all sections except the North Atlantic and Pacific. Half of the cases were reported from 2 States which consistently report more cases than other States, whether the disease is epidemic or normal. Ninety percent of the cases were reported from 10 States, viz, Texas (9,736 cases), South Carolina (3,294), Virginia (2,604), Indiana (1,667), West Virginia (1,517), Colorado (900), Alabama (795), Kansas (784), North Dakota (705), and Utah (631)—a total of 22,633 cases. Compared with preceding years the current incidence for the country as a whole was 3.6 times the 1940–44 median, while in the various sections the reported cases ranged from 1.5 times the median in the Middle Atlantic section to more than 22 times the median in the West North Central section. However, in periods of relatively low incidence, cases are so incompletely reported that a high ratio may not reflect a truly high incidence. In 2 sections, the New England and Pacific, the incidence was considerably below the normal expectancy.

Meningococcus meningitis.—The number of cases (397) of this disease was only about 60 percent of the number reported for the corresponding period in 1944, but it was 30 percent above the preceding 5-year (1940–44) median. Fewer cases were reported in each section than occurred in 1944, but only 3 sections, the New England, South Atlantic, and Mountain, reported a decline from the median incidence. An increase of this disease is normally expected at this season of the year, but it is not anticipated that the incidence will reach the epidemic proportions of the last 3 years.

Poliomyelitis.—The number of reported cases (932) of poliomyelitis was slightly below the 1944 incidence, but it was more than 20 percent above the 1940–44 median for the corresponding period. The Middle

Atlantic and South Atlantic sections reported fewer cases than in 1944 and in the East South Central section the incidence was approximately the same as in that year, but in all other sections the cases exceeded the 1944 incidence. Compared with the 1940–44 median the South Atlantic section alone reported a relatively low incidence. The number of cases of this disease dropped more than 50 percent during the current week and a further decline may be expected as the lowest incidence is normally reached during the winter months.

DISEASES BELOW MEDIAN PREVALENCE

Measles.—While the number of cases (8,146) of measles was three times that reported for the corresponding 4 weeks in 1944, it was only about 75 percent of the 1940–44 median. Every section of the country reported an increase over the 1944 incidence and all but the New England, Middle Atlantic, West North Central, and Mountain regions reported excesses over the preceding 5-year medians. The largest number of cases, and also the greatest excess over the normal seasonal incidence, was reported from the Pacific section.

Scarlet fever.—The incidence of scarlet fever was about normal for this period, the number of cases (10,714) being only slightly above the normal seasonal incidence. The increase appeared to be largely due to an excess of cases in the South Atlantic, West South Central, and Pacific sections, since in all other regions the incidence either approximated the median or fell below it. The greatest excess over the median was reported from the Pacific section, with 1,224 cases as compared with a median of 749 cases.

Smallpox.—The incidence of this disease was higher than during the corresponding period in 1944 but the number of cases (24) was only about one-half of the 1940–44 median incidence. The distribution of cases, however, was different from that in preceding years; in the East North Central section the number of cases was considerably below the preceding 5-year median while in the East South Central and Mountain regions the incidence was above the normal seasonal expectancy.

Typhoid and paratyphoid fever.—The number of cases (304) of typhoid fever was slightly higher than the 1944 figure for the corresponding 4 weeks, but it was not as high as the 1940–44 median. The New England section reported a 50-percent increase over the 5-year median; the West South Central and Pacific regions reported about the normal incidence, and in all other sections the incidence was relatively low.

Whooping cough.—More cases of whooping cough were reported for the current 4 weeks than occurred during the corresponding 4 weeks in 1944, but the number of cases (9,377) was only 70 percent of the

1940–44 median. Very significant increases over 1944 were reported from the North Central section, but only one region, New England, reported any increase over the preceding 5-year median.

MORTALITY, ALL CAUSES

For the 4 weeks ended December 1 there were 35,803 deaths from all causes reported by 93 large cities to the Bureau of the Census. The average number reported for the corresponding period in 1942–44 was 36,123 deaths. During the first week of the 4-week period the number of deaths was 3.8 percent higher than the preceding 3-year average, but during the other 3 weeks the deaths were 3.4, 0.9, and 2.7 percent, respectively, below the 3-year average.

DEATHS DURING WEEK ENDED DECEMBER 1, 1945

[From the Weekly Mortality Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 1, 1945	Corresponding week, 1944
Data for 93 large cities of the United States:		
Total deaths	9,462	9,406
Average for 3 prior years	9,728	
Total deaths, first 48 weeks of year	429,699	430,826
Deaths under 1 year of age	678	604
Average for 3 prior years	669	
Deaths under 1 year of age, first 48 weeks of year	29,074	29,078
Data from industrial insurance companies:		
Policies in force	67,283,755	66,918,568
Number of death claims	13,414	14,814
Death claims per 1,000 policies in force, annual rate	10.4	11.2
Death claims per 1,000 policies, first 48 weeks of year, annual rate	10.0	10.0

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

REPORTS FROM STATES FOR WEEK ENDED DECEMBER 8, 1945

Summary

A total of 49,694 cases of influenza was reported for the week, as compared with 13,220 for the preceding week, a 5-year (1940–44) median of 2,742, and 23,746 for the corresponding week of 1943, the latter figure being the largest number reported for a corresponding week in the preceding 5 years. Eleven of the forty-three States in which reports of influenza cases are required by law or regulation, located in 6 of the 9 geographic divisions, reported currently an aggregate of 46,912 cases, or 94 percent of the total. These States are as follows (last week's figures in parentheses): Kentucky 15,358 (14), Texas 7,332 (4,436), Kansas 6,848 (782), Utah 4,241 (383), Virginia 3,993 (1,438), West Virginia 3,395 (1,276), South Carolina 2,459 (1,117), Indiana 1,317 (1,253), Arkansas 785 (61), Colorado 607 (447), and Nebraska 577 (112). The same States reported 11,319 cases last week. Since July 1, a total of 94,260 cases has been reported, as compared with 23,238 and 49,062, respectively, for the corresponding periods of 1944 and 1943. The total for the year to date is 160,734, as compared with 358,761 for the same period in 1944 (most of which occurred in the early part of the year), 126,643 for 1943, and a 5-year median of 191,873.

Of the total of 118 cases of meningococcus meningitis, as compared with 105 last week, 190 and 287, respectively, for the corresponding weeks of 1944 and 1943, 50 occurred in the 4 States reporting more than 5 cases each, as follows: Illinois 16, New York 13, California 12, and Pennsylvania 9. The cumulative total is 7,618, as compared with 15,488 for the same period last year and a 5-year median of 3,387.

A total of 168 cases of poliomyelitis was reported, as compared with 173 last week, 133 for the corresponding week last year, and a 5-year median of 96. The 5 States reporting more than 7 cases each are California 21, Washington 20, Wisconsin 15, Missouri 13, and New York 12. The total to date is 13,443, as compared with 19,021 for the same period last year and a 5-year median of 9,600.

Deaths recorded during the week in 93 large cities of the United States totaled 9,945, as compared with 9,462 last week, 9,343 for the corresponding week last year, and a 3-year (1942–44) average of 9,752. The total to date is 439,644, as compared with 440,169 for the corresponding period last year.

Telegraphic morbidity reports from State health officers for the week ended December 8, 1945, and comparison with corresponding week of 1944 and 5-year median

In these tables a zero indicates a definite report, while leaders imply that, although none was reported, cases may have occurred.

Division and State	Diphtheria			Influenza			Measles			Meningitis, meningococcus		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944	
NEW ENGLAND												
Maine	4	0	1	------	------	1	8	2	54	0	1	0
New Hampshire	2	0	0	------	------	------	25	1	8	0	0	0
Vermont	0	0	0	------	------	------	4	2	24	0	0	0
Massachusetts	2	11	6	------	------	------	213	50	286	8	10	6
Rhode Island	0	1	1	------	25	1	------	1	2	1	1	1
Connecticut	2	0	1	8	1	2	6	16	16	2	8	8
MIDDLE ATLANTIC												
New York	19	6	16	[1] 5	[1] 2	[1] 8	227	56	430	13	26	11
New Jersey	3	8	4	19	2	7	30	17	25	8	7	5
Pennsylvania	12	17	11	21	3	3	447	27	495	9	17	10
EAST NORTH CENTRAL												
Ohio	41	17	14	94	9	14	15	20	36	4	9	3
Indiana	11	18	18	1,317	10	10	7	4	20	3	3	1
Illinois	7	3	10	88	8	10	244	41	69	16	12	3
Michigan [2]	8	14	9	2	1	2	190	24	89	1	8	1
Wisconsin	6	2	1	61	16	34	30	17	140	3	5	2
WEST NORTH CENTRAL												
Minnesota	6	10	5	4	2	2	1	4	6	1	1	0
Iowa	10	7	2	176	------	2	2	31	40	3	5	1
Missouri	10	10	6	42	3	3	66	1	7	2	5	1
North Dakota	2	18	2	277	10	10	4	3	3	1	0	0
South Dakota	0	1	1	------	------	------	1	------	1	0	0	0
Nebraska	1	6	2	577	------	------	10	7	7	1	0	0
Kansas	8	2	4	6,848	2	14	24	8	21	1	0	0
SOUTH ATLANTIC												
Delaware [2]	0	0	0	11	------	------	1	5	5	0	0	0
Maryland [2]	12	10	5	27	8	6	7	4	4	1	4	4
District of Columbia	1	0	0	8	1	2	1	3	3	1	2	0
Virginia	43	5	21	3,998	287	287	61	6	69	2	4	4
West Virginia	6	6	6	3,395	12	12	------	8	11	1	1	2
North Carolina	46	20	20	------	------	3	34	11	26	2	1	1
South Carolina	9	3	5	2,459	222	409	49	8	20	1	2	1
Georgia	23	17	17	253	53	116	4	2	27	6	2	1
Florida	4	5	5	6	------	10	3	3	3	3	5	1
EAST SOUTH CENTRAL												
Kentucky	13	14	8	15,358	1	5	122	3	22	3	2	2
Tennessee	15	11	11	299	20	30	4	29	21	3	4	1
Alabama	13	19	17	362	58	65	3	1	12	3	3	2
Mississippi [2]	20	12	9	------	------	------	------	------	------	2	2	1
WEST SOUTH CENTRAL												
Arkansas	21	5	9	785	59	87	19	3	22	5	3	0
Louisiana	20	15	9	50	1	13	10	3	3	1	2	2
Oklahoma	9	6	9	180	130	185	14	6	6	0	1	1
Texas	73	56	55	7,382	1,352	1,245	52	25	64	3	9	2
MOUNTAIN												
Montana	3	2	2	129	21	12	6	3	52	1	0	0
Idaho	1	4	1	181	3	2	136	1	1	0	1	0
Wyoming	0	0	0	42	11	11	9	------	3	0	0	0
Colorado	8	3	6	607	11	46	41	2	28	0	1	1
New Mexico	5	9	2	3	------	------	1	1	2	0	0	0
Arizona	2	1	1	323	61	127	5	1	12	0	0	0
Utah [2]	1	0	0	4,241	3	10	34	8	12	0	3	1
Nevada	0	0	0	46	------	------	------	1	1	0	0	0
PACIFIC												
Washington	4	8	5	------	1	2	259	34	34	1	9	1
Oregon	6	5	3	[3] 45	14	16	25	30	40	0	2	2
California	21	33	23	50	31	69	333	249	105	12	14	6
Total	528	415	393	49,604	2,449	2,742	2,787	777	4,285	118	190	108
49 weeks	17,272	13,018	14,643	160,784	358,761	191,873	121,089	600,050	580,588	7,618	15,458	3,387

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] 4,100 additional cases estimated for Oregon, not included in totals.

Telegraphic morbidity reports from State health officers for the week ended December 8, 1945, and comparison with corresponding week of 1944, and 5-year median—Con.

Division and State	Poliomyelitis			Scarlet fever			Smallpox			Typhoid and paratyphoid fever [4]		
	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44	Week ended—		Median 1940–44
	Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944		Dec. 8, 1945	Dec. 9, 1944	
NEW ENGLAND												
Maine	4	1	1	30	45	21	0	0	0	0	3	2
New Hampshire	0	0	0	6	21	6	0	0	0	0	0	0
Vermont	1	0	0	6	10	7	0	0	0	0	0	0
Massachusetts	5	4	4	122	283	244	0	0	0	2	4	2
Rhode Island	0	0	0	9	18	7	0	0	0	1	0	0
Connecticut	0	0	0	18	34	37	0	0	0	0	1	1
MIDDLE ATLANTIC												
New York	12	46	14	278	287	278	0	0	0	4	7	6
New Jersey	7	4	2	61	76	95	0	0	0	0	4	2
Pennsylvania	0	3	2	165	247	225	0	0	0	6	4	4
EAST NORTH CENTRAL												
Ohio	4	9	5	255	345	278	0	1	0	2	3	6
Indiana	2	0	0	65	145	99	1	4	4	0	1	1
Illinois	7	3	4	155	228	202	0	0	1	1	1	1
Michigan [3]	3	3	3	154	212	154	0	2	1	3	0	1
Wisconsin	15	3	1	118	92	146	0	0	1	1	0	1
WEST NORTH CENTRAL												
Minnesota	2	0	0	37	56	88	0	0	0	0	0	0
Iowa	0	3	2	46	52	67	0	0	1	0	1	0
Missouri	13	2	1	48	41	54	0	0	0	0	1	2
North Dakota	0	0	1	6	14	14	0	0	0	0	0	0
South Dakota	0	0	0	4	7	38	0	0	0	0	0	0
Nebraska	1	0	0	47	54	81	0	0	0	0	0	0
Kansas	8	1	1	66	104	88	1	1	1	1	1	1
SOUTH ATLANTIC												
Delaware	0	1	0	6	7	7	0	0	0	1	0	0
Maryland [3]	1	1	1	58	119	61	0	0	0	0	1	2
District of Columbia	2	1	0	20	24	15	0	0	0	0	0	0
Virginia	3	2	2	90	69	52	0	0	0	0	5	5
West Virginia	0	1	1	67	72	50	0	0	0	1	0	1
North Carolina	4	5	1	58	96	99	0	0	0	1	1	2
South Carolina	2	0	0	17	12	17	0	0	0	1	8	8
Georgia	3	1	1	28	34	34	0	1	0	3	4	4
Florida	8	0	0	13	14	7	0	0	0	1	0	1
EAST SOUTH CENTRAL												
Kentucky	1	2	2	58	49	75	0	0	0	1	0	2
Tennessee	2	0	0	58	57	58	1	0	0	3	2	4
Alabama	2	1	1	27	31	31	0	0	0	0	0	0
Mississippi [3]	3	0	0	19	17	20	0	0	0	0	1	1
WEST SOUTH CENTRAL												
Arkansas	2	2	1	22	15	6	0	0	0	2	0	2
Louisiana	5	0	1	39	14	8	0	1	0	3	1	3
Oklahoma	0	1	1	22	32	26	0	0	0	0	2	2
Texas	5	2	2	121	102	68	0	0	0	11	4	10
MOUNTAIN												
Montana	1	0	0	14	22	22	0	0	0	0	2	0
Idaho	0	0	0	27	65	12	4	0	0	0	0	0
Wyoming	1	0	0	1	8	7	0	0	0	0	1	0
Colorado	2	0	1	35	59	86	0	0	0	0	0	0
New Mexico	1	2	0	85	21	12	0	0	0	0	0	3
Arizona	1	0	0	27	9	4	0	0	0	0	0	0
Utah [3]	4	0	1	35	19	22	0	0	0	0	1	0
Nevada	0	0	0	0	2	2	0	1	0	0	0	0
PACIFIC												
Washington	20	11	3	38	113	35	0	0	0	0	1	0
Oregon	0	2	2	40	37	20	0	0	0	1	3	0
California	21	16	13	245	388	144	0	0	0	2	8	4
Total	168	133	96	2,901	3,768	3,091	7	11	13	52	71	84
49 weeks	13,448	19,021	9,600	164,899	179,335	131,727	339	371	750	4,729	5,240	6,681

[3] Period ended earlier than Saturday.
[4] Including paratyphoid fever reported separately, as follows: Massachusetts, 1; New York, 3; Georgia, 2; California, 1.

Telegraphic morbidity reports from State health officers for the week ended December 8, 1945, and comparison with corresponding week of 1944 and 5-year median—Con.

Division and State	Whooping cough: Week ended— Dec. 8, 1945	Whooping cough: Week ended— Dec. 9, 1944	Whooping cough: Median 1940–44	Week ended Dec. 8, 1945: Dysentery: Amebic	Dysentery: Bacillary	Dysentery: Unspecified	Encephalitis, infectious	Rocky Mt. spotted fever	Tularemia	Typhus fever, endemic	Undulant fever
NEW ENGLAND											
Maine	41	35	36								2
New Hampshire	26		2								
Vermont	23	39	30								1
Massachusetts	150	121	218								3
Rhode Island	81	12	24		1						
Connecticut	73	90	61		1						4
MIDDLE ATLANTIC											
New York	320	288	450		15		1				6
New Jersey	164	72	171	1		7				1	
Pennsylvania	180	152	165					1			
EAST NORTH CENTRAL											
Ohio	201	119	152		1						5
Indiana	28	7	16								2
Illinois	127	65	140	7	1		2		2		5
Michigan [2]	186	69	282	1					1		2
Wisconsin	99	82	161								5
WEST NORTH CENTRAL											
Minnesota	15	30	45	1							5
Iowa	6	2	28						1		
Missouri	4	6	9								
North Dakota		3	17								
South Dakota	2	4	3								
Nebraska	16		2								
Kansas	11	18	37								2
SOUTH ATLANTIC											
Delaware	1		6								
Maryland [2]	27	76	76			1			1		1
District of Columbia	5	8	14								
Virginia	54	27	75			15			1	4	1
West Virginia	26	20	33				1				
North Carolina	59	85	142	1					3	8	
South Carolina	74	10	32	1	11					4	
Georgia	27	1	9							81	1
Florida	5	13	10						1	4	1
EAST SOUTH CENTRAL											
Kentucky	51	8	67						12		1
Tennessee	14	7	42						5	4	
Alabama	2	39	21							14	3
Mississippi [2]									2	9	1
WEST SOUTH CENTRAL											
Arkansas	4	29	20	1					2		
Louisiana	1	4	4	4					3	10	2
Oklahoma	12	13	11								
Texas	124	150	138	10	275	42				28	11
MOUNTAIN											
Montana	6	24	24						1		
Idaho	12	4	4								
Wyoming	1	6	4								
Colorado	32	5	31	1	1						
New Mexico	2		16								
Arizona	6	7	14			33					
Utah [2]	10	53	24								
Nevada			4								
PACIFIC											
Washington	48	25	61								1
Oregon	18	12	12								
California	108	126	192	2	4		4				3
Total	2,432	1,966	3,572	30	310	98	8	1	35	112	68
Same week, 1944	1,966			46	493	159	10		36	134	83
Average, 1942–44	2,738			48	444	110	8	([6])	26	[5] 98	
49 weeks: 1945	118,689			1,835	23,635	10,206	605	465	729	4,970	4,669
1944	90,576			1,767	23,351	8,664	617	453	578	5,019	3,640
Average, 1942–44	143,967		[5]169,469	1,658	17,403	7,427	606	[5] 451	720	[5] 3,509	

[2] Period ended earlier than Saturday.
[5] 5-year median, 1940–44.
Leprosy: Florida, 1 case;

WEEKLY REPORTS FROM CITIES

City reports for week ended December 1, 1945

This table lists the reports from 85 cities of more than 10,000 population distributed throughout the United States, and represents a cross section of the current urban incidence of the diseases included in the table.

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
NEW ENGLAND												
New Hampshire:												
Concord	0	0	------	0	------	0	0	0	2	0	0	------
Vermont:												
Barre	0	0	------	0	------	0	0	0	0	0	0	------
Massachusetts:												
Boston	0	0	------	0	5	2	11	2	19	0	0	28
Fall River	0	0	------	0	------	0	0	0	3	0	0	1
Springfield	0	0	------	0	1	0	1	0	5	0	0	4
Worcester	0	1	------	0	10	0	4	0	3	0	0	6
Rhode Island:												
Providence	0	0	------	0	------	1	3	0	6	0	0	29
Connecticut:												
Bridgeport	0	0	------	0	------	0	0	0	0	0	0	------
Hartford	0	0	------	0	1	0	0	0	1	0	0	10
New Haven	0	0	------	0	------	0	1	0	0	0	1	7
MIDDLE ATLANTIC												
New York:												
Buffalo	0	0	------	1	3	0	9	0	5	0	0	26
New York	8	3	4	1	84	5	54	5	94	0	2	61
Rochester	0	0	------	0	4	0	8	0	1	0	1	8
Syracuse	0	0	------	0	44	1	0	0	2	0	0	6
New Jersey:												
Camden	0	0	------	0	------	0	1	0	0	0	0	3
Newark	0	0	3	0	2	0	7	1	9	0	0	28
Trenton	0	0	------	0	------	0	0	0	0	0	0	------
Pennsylvania:												
Philadelphia	2	0	13	4	31	6	20	2	30	0	1	47
Pittsburgh	0	0	------	0	1	2	15	0	11	0	0	10
Reading	0	0	------	0	------	0	0	0	0	0	0	9
EAST NORTH CENTRAL												
Ohio:												
Cincinnati	4	0	------	1	------	1	11	0	12	0	0	10
Cleveland	1	0	65	0	------	2	9	1	18	0	0	29
Columbus	4	0	------	0	1	0	1	0	14	0	0	4
Indiana:												
Fort Wayne	0	0	------	0	------	0	1	0	1	0	0	------
Indianapolis	1	0	------	2	2	0	11	1	8	0	0	4
South Bend	0	0	------	0	------	0	0	0	2	0	0	------
Terre Haute	0	0	------	0	------	0	0	0	1	0	1	------
Illinois:												
Chicago	2	0	5	0	188	16	86	2	47	0	0	75
Springfield	0	0	------	0	------	0	1	0	3	0	0	5
Michigan:												
Detroit	5	0	------	0	47	0	16	1	37	0	0	105
Flint	0	0	------	0	15	0	1	0	3	0	0	1
Grand Rapids	0	0	------	0	------	0	0	0	3	0	1	8
Wisconsin:												
Kenosha	0	0	------	0	------	0	0	0	2	0	0	------
Milwaukee	2	0	------	0	3	0	2	2	20	0	1	12
Racine	0	0	------	0	1	0	1	0	2	0	0	1
Superior	0	0	------	0	------	0	0	0	0	0	0	4
WEST NORTH CENTRAL												
Minnesota:												
Duluth	2	0	------	0	------	0	0	0	2	0	0	4
Minneapolis	4	0	------	1	3	0	3	0	12	0	0	5
St. Paul	1	0	------	0	------	3	5	0	2	0	0	6
Missouri:												
Kansas City	1	0	------	1	5	0	10	2	14	0	0	1
St. Joseph	0	0	------	0	19	0	0	0	3	0	0	------
St. Louis	0	0	13	1	2	0	20	6	18	0	0	2

City reports for week ended December 1, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
WEST NORTH CENTRAL—continued												
Nebraska:												
Omaha	0	0	------	0	2	0	3	0	12	0	0	------
Kansas:												
Topeka	0	0	------	0	------	1	0	0	6	0	0	3
Wichita	0	0	1	0	5	0	3	0	8	0	0	1
SOUTH ATLANTIC												
Delaware:												
Wilmington	0	0	------	0	1	0	0	0	3	0	0	1
Maryland:												
Baltimore	11	0	6	1	1	0	11	0	18	0	0	29
Cumberland	0	0	------	0	------	0	1	0	0	0	0	------
Frederick	0	0	------	0	------	0	1	0	0	0	0	------
District of Columbia:												
Washington	1	0	2	0	2	3	6	5	7	0	2	4
Virginia:												
Lynchburg	0	0	------	0	1	0	0	0	9	0	0	2
Richmond	0	0	2	2	1	0	4	0	14	0	0	1
Roanoke	0	0	------	0	------	0	1	0	3	0	0	------
West Virginia:												
Wheeling	0	0	------	0	1	0	3	0	5	0	0	------
North Carolina:												
Raleigh	0	0	------	0	------	0	1	0	3	0	0	8
Wilmington	0	0	------	0	------	0	1	0	2	0	0	3
Winston-Salem	3	0	------	0	------	0	1	0	3	0	0	18
South Carolina:												
Charleston	0	0	29	0	------	0	0	0	3	0	0	------
Georgia:												
Atlanta	0	0	60	1	------	0	2	0	1	0	0	------
Brunswick	0	0	------	0	------	0	0	0	0	0	0	------
Florida:												
Tampa	4	0	------	0	------	0	2	0	4	0	1	5
EAST SOUTH CENTRAL												
Tennessee:												
Memphis	2	0	5	1	5	2	4	1	6	0	0	11
Nashville	0	0	------	2	1	0	0	1	2	0	0	------
Alabama:												
Birmingham	0	0	5	2	1	0	7	0	12	0	0	------
Mobile	2	0	------	0	------	0	1	0	0	0	0	------
WEST SOUTH CENTRAL												
Arkansas:												
Little Rock	1	0	------	0	1	1	0	0	0	0	0	------
Louisiana:												
New Orleans	8	0	1	0	------	1	0	8	10	0	1	1
Shreveport	0	0	------	0	------	0	3	0	3	0	0	------
Texas:												
Dallas	6	0	------	0	------	0	2	0	15	0	0	------
Galveston	0	0	------	0	------	0	0	0	1	0	0	------
Houston	4	0	------	0	------	0	9	0	5	0	0	------
San Antonio	6	0	1	1	1	0	8	1	2	0	0	------
MOUNTAIN												
Montana:												
Billings	0	0	------	0	------	0	0	0	0	0	0	------
Great Falls	1	0	------	0	------	0	0	0	0	0	0	------
Helena	0	0	------	0	------	0	0	0	2	0	0	------
Missoula	0	0	------	0	------	0	1	0	2	0	0	------
Idaho:												
Boise	0	0	------	0	------	0	0	0	0	0	0	------
Colorado:												
Pueblo	1	0	------	0	------	0	4	0	1	0	0	------
Utah:												
Salt Lake City	0	0	------	2	3	0	0	0	4	0	0	3

City reports for week ended December 1, 1945—Continued

	Diphtheria cases	Encephalitis, infectious, cases	Influenza		Measles cases	Meningitis, meningococcus, cases	Pneumonia deaths	Poliomyelitis cases	Scarlet fever cases	Smallpox cases	Typhoid and paratyphoid fever cases	Whooping cough cases
			Cases	Deaths								
PACIFIC												
Washington:												
Seattle	1	0		0	90	0	4	3	6	0	1	9
Spokane	0	0		0	1	0	1	0	1	0	0	1
Tacoma	0	0		0	71	0	1	0	3	0	0	
California:												
Los Angeles	2	0	17	0	16	1	2	7	51	0	1	22
Sacramento	2	0		0	10	0	1	1	6	0	0	
San Francisco	0	0		0	54	0	9	5	11	0	1	2
Total	92	4	232	24	690	47	354	57	659	0	15	683
Corresponding week, 1944	100		73	26	178		336		917	0	12	507
Average, 1940-44	84		686	[1] 48	[2] 898		[1] 442		844	3	16	918

[1] 3-year average, 1942-44.
[2] 5-year median, 1940-44.

Dysentery, amebic.—Cases: New York 1.
Dysentery, bacillary.—Cases: Providence 2; New Haven 1; New York 10; Chicago 2; Detroit 1; Charleston, S. C., 5; Los Angeles 6.
Dysentery, unspecified.—Cases: San Antonio 26.
Typhus fever, endemic.—Cases: Atlanta 4; Tampa 1; Nashville 5; Birmingham 5; Mobile 1; Little Rock 1; New Orleans 1; Dallas 1.

Rates (annual basis) per 100,000 population, by geographic groups, for the 85 cities in the preceding table (estimated population, 1943, 33,755,400)

	Diphtheria case rates	Encephalitis, infectious, case rates	Influenza		Measles case rates	Meningitis, meningococcus, case rates	Pneumonia death rates	Poliomyelitis case rates	Scarlet fever case rates	Smallpox case rates	Typhoid and paratyphoid fever case rates	Whooping cough case rates
			Case rates	Death rates								
New England	0.0	2.7	0.0	0.0	46	8.2	54.4	5.4	106	0.0	2.7	231
Middle Atlantic	4.6	1.4	9.3	2.8	55	6.5	50.5	3.7	70	0.0	1.9	92
East North Central	11.6	0.0	42.6	1.8	156	10.9	54.7	4.3	105	0.0	1.8	157
West North Central	16.1	0.0	28.2	6.0	72	8.0	88.5	16.1	155	0.0	0.0	44
South Atlantic	33.1	0.0	172.4	7.0	12	5.2	59.2	8.7	181	0.0	5.2	124
East South Central	23.6	0.0	59.0	29.5	41	11.8	70.8	11.8	118	0.0	0.0	65
West South Central	71.7	0.0	5.7	2.9	6	5.7	63.1	25.8	103	0.0	2.9	3
Mountain	32.6	0.0	0.0	32.6	49	0.0	81.4	0.0	147	0.0	0.0	49
Pacific	7.9	0.0	26.9	0.0	383	1.6	28.5	25.3	123	0.0	4.7	54
Total	14.3	0.6	35.9	3.7	107	7.3	54.8	8.8	102	0.0	2.8	106

FOREIGN REPORTS

CANADA

Provinces—Communicable diseases—Week ended November 10, 1945.—During the week ended November 10, 1945, cases of certain communicable diseases were reported by the Dominion Bureau of Statistics of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Chickenpox		24		196	260	79	55	79	60	753
Diphtheria		4	2	61	12	8	4	2		93
Dysentery, bacillary				12						12
German measles				9	10	2	5	2	4	32
Influenza		1			6				1	8
Measles		2	1	141	339	4	12	6	49	554
Meningitis, meningococcus					1		1			2
Mumps		2		102	72	12	8	36	21	253
Poliomyelitis					13			1	3	17
Scarlet fever		14	20	174	85	18	7	20	18	351
Tuberculosis (all forms)		18	17	68	34	5	52		41	230
Typhoid and paratyphoid fever				16	3	1			1	21
Undulant fever				1	2			2		5
Venereal diseases:										
Gonorrhea		14	28	121	175	57	30	74	104	603
Syphilis		20	12	105	111	8	9	22	56	343
Whooping cough				197	44		5			246

[1] Includes 1 case, delayed report.

UNION OF SOUTH AFRICA

Transvaal—Brakpan—Typhoid fever.—A report dated November 14, 1945, stated that an outbreak of typhoid fever had occurred in Brakpan, a suburb about 30 miles east of Johannesburg, Transvaal, Union of South Africa. Up to that date over 200 cases had been reported. The outbreak is said to have been caused by a carrier working in a dairy.

WORLD DISTRIBUTION OF CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Health, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases; P, present]

NOTE.—Since many of the figures in the following tables are from weekly reports, the accumulated totals are for approximate dates.

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
ASIA							
Ceylon: Trincomalee District	C		16				
China:[1]							
Hupeh Province	C	60					
Kwangsi Province	C	12					
Kwangtung Province	C	105					
Kweichow Province	C	640					
Shensi Province	C	10					
Sikong Province	C	9					
Szechwan Province	C	13,342					
Chungking	C	8,000					
Yunnan Province	C	28					
India	C	210,945	2,455				
Bombay	C	94	4	1			
Calcutta	C	5,000	120	18	20	18	
Cawnpore	C	199	8				
Chittagong	C	19					
Delhi	C	314	4				
Madras	C	52					
Vizagapatam	C	31					
Indochina: Cochinchina	C	P					

[1] Cholera was also reported present during August in the following Provinces of China: Chekiang, Honan, Hunan, and Kansu.

PLAGUE

[C indicates cases; D, deaths]

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
AFRICA							
Algeria [1]	C	[2] 13					
Basutoland	C	4					
Bechuanaland	C	7					
Belgian Congo	C	17	[3] 7	1	1	1	1
British East Africa:							
Kenya	C	[4] 81	4	2			
Uganda	C	6					
Egypt	C	215	5				
Ismailiya	C	88					
Port Said	C	82	1				
Suez	C	19	4				
French West Africa	C	5					
Dakar	C	1					
Madagascar	C	128	11		[5] 3		
Morocco (French)	C	800	28				
Senegal	C	54					
Tunisia	C	8					
Union of South Africa	C	7	1		1	1	
ASIA							
China:							
Foochow	C	30					
Kwantung Province	C	17					
Kiangsi Province	C	1					
Yunnan Province [6]	C	88					
India	C	20,737	1,568				
Iraq	C	34					
Palestine	C	19	5	7	6		[7] 1
Plague-infected rats		21	1				

See footnotes at end of table.

PLAGUE—Continued

[C indicates cases; D, deaths]

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
EUROPE							
France: Corsica—Ajaccio	C	8					
Great Britain: Malta	C	[7] 50	12	4	4	1	1
Italy	C	23	2				
Portugal: Azores	C	24	26				
Spain: Canary Islands	C	1					
NORTH AMERICA							
Canada: Alberta Province:[8]							
Plague-infected squirrels		2					
SOUTH AMERICA							
Argentina:							
Buenos Aires Province—Plague-infected rats		2					
Santiago del Estero Province	C	2					
Tucuman Province	C		1				
Bolivia: Santa Cruz Department	C	[9] 79					
Brazil:							
Ceara State	C	2					
Pernambuco State	C	33					
Ecuador:							
Canar Province	C	9					
Chimborazo Province	C	6					
Loja Province	C	20					
Peru:							
Ancash Department	C	3					
Icá Department	C	[10] 4					
Lambayeque Department	C	13					
Libertad Department	C	11					
Lima Department	C	13					
Otuzco Department	C	3					
Piura Department	C	5					
Tumbes Province	C						[11] 15
OCEANIA							
Hawaii Territory	D	[12] 1					
Plague-infected rats[13]		13					
New Caledonia: Loyalty Islands—Mare Island	C	[14] 60					

[1] For the week ended Dec. 8, 1945, 1 case of plague was reported in Saint Cloud, Oran Department, Algeria. This is the first reported case of plague in Algeria since the week ended Aug. 11, 1945.

[2] Includes 4 cases of pneumonic plague.

[3] Suspected.

[4] Includes 5 suspected cases.

[5] For the period Nov. 1–10, 1945.

[6] Information dated July 5, 1945, stated that from April 1944 to May 1945, 85 deaths from plague had occurred in the mountainous region south of Kunming, China.

[7] Includes 4 suspected cases.

[8] During the month of June 1945, plague infection in fleas was reported in Alberta Province. For the week ended July 28, 1945, plague infection was also reported in 6 pools of fleas in Alberta Province. For the week ended Aug. 11, 1945, 2 pools of plague infected fleas reported in Alberta Province, Canada.

[9] Includes 6 suspected cases.

[10] Includes 1 suspected case.

[11] According to a telegraphic report dated Nov. 30, 1945, 15 cases of suspected plague were reported in Tumbes.

[12] Previously reported as a case, death occurring on June 2, 1945.

[13] Plague infection was also proved positive in a pool of 5 mice on Jan. 4, in a pool of fleas on Feb. 14, and in a pool of 40 fleas on Mar. 14, 1945.

[14] Pneumonic plague.

SMALLPOX

[C indicates cases; P, present]

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
AFRICA							
Algeria	C	209					
Angola	C	224					
Basutoland	C	350	2				
Belgian Congo	C	6,119	[1] 337	[1] 36			
British East Africa:							
Kenya	C	372	235				
Nyasaland	C	89	31		17	11	10
Tanganyika	C	4,567	477	583			
Uganda	C	901	94				
Cameroon (French)	C	809	8				
Dahomey	C	206	58				
Egypt	C	1,065	5				
French Equatorial Africa	C	1,556	1				
French Guinea	C	1,568	24				
French West Africa: Dakar District	C	397	4				
Gambia	C	82					
Gold Coast	C	428	38	3	14		
Ivory Coast	C	514	15				
Libya	C	8		2			
Mauritania	C	83					
Morocco (French)	C	1,482	344				[2] 260
Mozambique	C	1					
Nigeria	C	3,824					
Niger Territory	C	511					
Rhodesia:							
Northern	C	4,185		507			
Southern	C	10					
Senegal	C	498					
Sierra Leone	C	82		14		1	
Sudan (Anglo-Egyptian)	C	[3] 3					
Sudan (French)	C	2,114	96				
Togo (British)	C	36					7
Togo (French)	C	507					
Tunisia	C	15					
Union of South Africa[4]	C	1,947		P	P	P	
ASIA							
Arabia	C	29					
Ceylon	C	[5] 597	64	20		47	
China	C	1,272					
India	C	224,567	935				
Iran	C	890	10				
Iraq	C	39					
Syria and Lebanon	C	12					
Trans-Jordan	C	2					
Turkey (see Turkey in Europe.)							
EUROPE							
Belgium	C	1					
France	C	27					
Germany	C		3				
Great Britain: Scotland	C	[3] 2					
Italy	C	2,186					
Sicily	C	9					
Portugal	C	26					
Spain	C	81					
Canary Islands	C	1					
Turkey	C	294					
NORTH AMERICA							
Canada	C	6					
Guatemala	C	4					
Honduras	C	3					
Mexico	C	1,392					
Nicaragua	C	[1] 141					
SOUTH AMERICA							
Bolivia	C	1,329	166				
Brazil	C	[6] 654					
Colombia	C	589					
Ecuador	C	38	1				
Paraguay	C	1					
Peru	C	96					
Uruguay	C	79					
Venezuela	C	[6] 664	[6] 82				

[1] Alastrim.
[2] For the period Nov. 1–20, 1945.
[3] Imported.
[4] For the week ended June 30, 1945, cases of virulent smallpox were reported in the Union of South Africa.
[5] Includes some cases of chickenpox.
[6] Includes cases of alastrim.

TYPHUS FEVER*

[C indicates cases; P, present]

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
AFRICA							
Algeria	C	1,021	------	------	------	------	------
Basutoland	C	[1] 114	------	------	------	------	------
Belgian Congo [3]	C	254	48	7	------	------	------
British East Africa, Kenya	C	33	6	------	------	------	------
Egypt	C	15,416	60	------	------	------	------
Eritrea	C	------	39	------	------	------	------
French West Africa: Dakar [3]	C	20	------	------	------	------	------
Gold Coast	C	1	------	------	------	------	------
Libya: Tripolitania	C	18	2	1	1	------	------
Madagascar	C	1	------	------	------	------	------
Morocco (French)	C	7,184	381	------	------	[3] 147	------
Morocco (Spanish)	C	6	1	------	------	------	------
Nigeria	C	77	------	------	------	------	------
Rhodesia, Northern	C	31	------	------	------	------	------
Sierra Leone [1]	C	7	1	2	------	1	------
Tunisia	C	385	------	------	------	------	------
Union of South Africa	C	776	P	P	P	P	------
ASIA							
China	C	1,874	------	------	------	------	------
India	C	23	------	------	------	------	------
Iran	C	826	------	------	------	------	------
Iraq [3]	C	241	7	5	5	3	5
Palestine [3]	C	142	------	------	------	------	------
Syria and Lebanon	C	12	------	------	------	------	------
Trans-Jordan	C	43	2		1	------	------
Turkey (see Turkey in Europe).							
EUROPE							
Albania	C	100	------	------	------	------	------
Austria	C	46	------	------	------	1	3
Belgium	C	158	------	------	------	------	------
Bulgaria	C	932	2	14	------	7	------
Czechoslovakia	C	313	------	------	------	------	------
Denmark	C	146	------	------	------	------	------
France	C	267	------	------	------	------	------
Germany	C	7,898	------	11	------	------	9
Gibraltar [3]	C	5	1	2	1	------	------
Great Britain	C	[4] 21	------	------	3	------	------
Malta and Gozo [3]	C	15	------	------	------	------	------
Greece	C	211	132	------	------	------	------
Hungary.[5]							
Italy	C	188	------	------	------	------	------
Netherlands	C	51	3	------	------	------	------
Poland	C	13,352	388	71	------	------	------
Portugal	C	49	2	------	1	------	------
Rumania	C	[6] 7,831	------	100	87	6	220
Spain	C	25	1	------	------	------	------
Sweden	C	226	------	------	------	------	------
Switzerland	C	2	4	------	------	------	------
Turkey	C	2,448	63	18	19	32	18
Yugoslavia	C	2,182	------	------	------	------	------
NORTH AMERICA							
Canada [1]	C	1	------	------	------	------	------
Costa Rica [3]	C	7	------	------	------	4	1
Cuba [3]	C	11	2	------	------	------	------
Guatemala	C	2,343	------	------	------	------	------
Jamaica [1]	C	37	6	------	1	------	------
Martinique [3]	C	1	------	------	------	------	------
Mexico	C	1,542	------	------	------	------	------
Panama (Republic)	C	8	1	------	------	------	------
Puerto Rico [1]	C	154	18	------	------	------	2
Virgin Islands [1]	C	8	------	------	------	------	------

See footnotes at end of table.

TYPHUS FEVER—Continued

[C indicates cases; P, present]

Place		January—September 1945	October 1945	November 1945—week ended—			
				3	10	17	24
SOUTH AMERICA							
Argentina	C	8	1				
Bolivia	C	598	43				
Brazil	C	5					
Chile [2]	C	470					
Colombia	C	199	70				
Curacao	C	2	1				
Ecuador	C	462	54				
Peru	C	558					
Venezuela [2]	C	98	11				
OCEANIA							
Australia [3]	C	101	3	4			
Hawaii Territory [2]	C	82			2	1	

*Reports from some areas are probably murine type, while others probably include both murine and louse-borne types.

[1] Corrected figure.
[2] Reports cases as murine type.
[3] For the period Nov. 1-20, 1945.
[4] Includes imported cases.
[5] For the period Jan. 1 to Sept. 1, 1945, between 8,000 and 10,000 cases of typhus fever were reported in Hungary.
[6] For the period Jan. 1-20, 1945.

YELLOW FEVER

[C indicates cases; D, deaths]

Place		January—September 1945	October 1945	November 1945—week ended— 3	10	17	24
AFRICA							
Gold Coast	C	[1] 13					
Nsawam	C	[2] 3					
Takoradi	C	1					
Tamale	C	[3] 1					
Winneba	C	[4] 4					
Ivory Coast:							
Gaoua	C	1					
Guiglo	C	1					
Sierra Leone: Moyamba	C	2					
Sudan (French): Bamako	C		[3] 1				
SOUTH AMERICA							
Bolivia:							
Beni Department	C	1					
La Paz Department	C	2					
Brazil:							
Goias State	D	76					
Minas Geraes State	D	25					
Para State	D	1					
British Guiana: Kwakwani	C	1					
Colombia:							
Magdalena Department	D	2					
Santander de Norte Department	D	18					
Peru:							
Cusco Department	C	3					
Junin Department	C		3				
Loreto Department	C	1					
Venezuela:							
Bolivar State	C	1					
Merida State	C	2	1				
Tachira State	D	20					
Zulia State	C	7	1				

[1] Includes 4 suspected cases.
[2] Includes 2 suspected cases.
[3] Suspected.
[4] Includes 1 suspected case.

FEDERAL SECURITY AGENCY

UNITED STATES PUBLIC HEALTH SERVICE

THOMAS PARRAN, *Surgeon General*

DIVISION OF PUBLIC HEALTH METHODS

G. ST. J. PERROTT, *Chief of Division*

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